



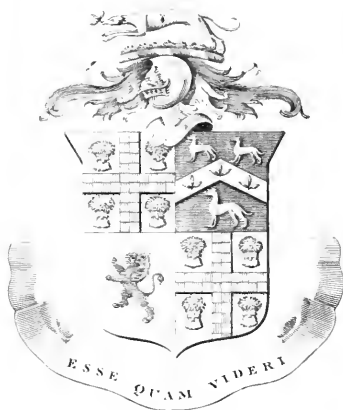
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A HISTORY OF THE EARTH AND ANIMATED NATURE.

BY OLIVER GOLDSMITH.

WITH COPIOUS NOTES;

And an Appendix,

CONTAINING EXPLANATIONS OF TECHNICAL TERMS, AND AN OUTLINE OF
THE CUVIERIAN AND OTHER SYSTEMS,

BY

CAPTAIN THOMAS BROWN,

F.L.S., M.W.S., M.K.S.

VOL. II—PART I

A. FULLARTON AND CO.,
EDINBURGH, GLASGOW, AND LONDON.

1840.



Q.L.

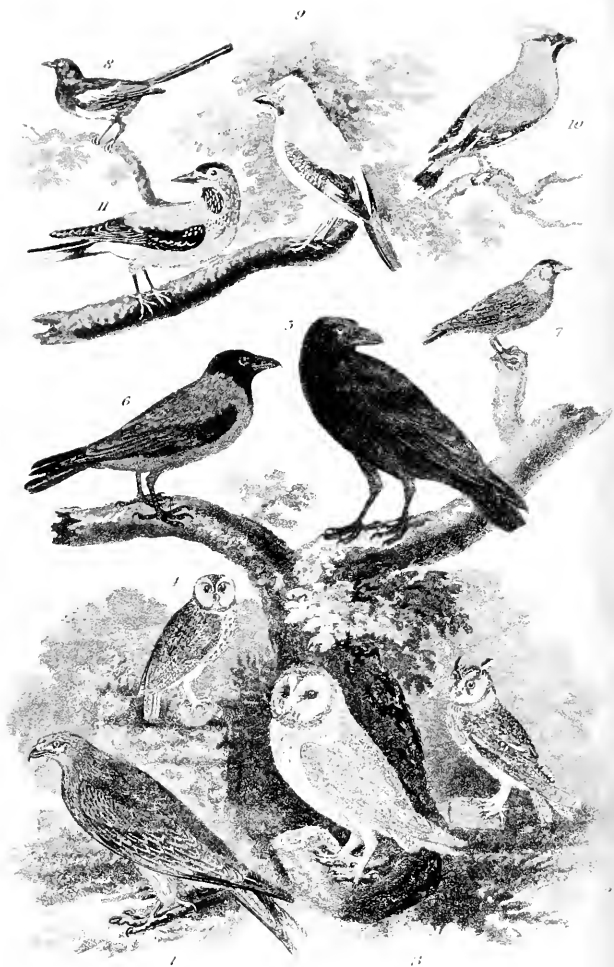
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Pt. 2

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1 Kite 2 Long-Eared Owl 3 Horned Owl 4 Barn Owl 5 Raven 6 Hooded Merganser
7 Jackdaw 8 Magpie 9 Jay 10 Thrush 11 Nuthatch 12 Vulture





R. Scott

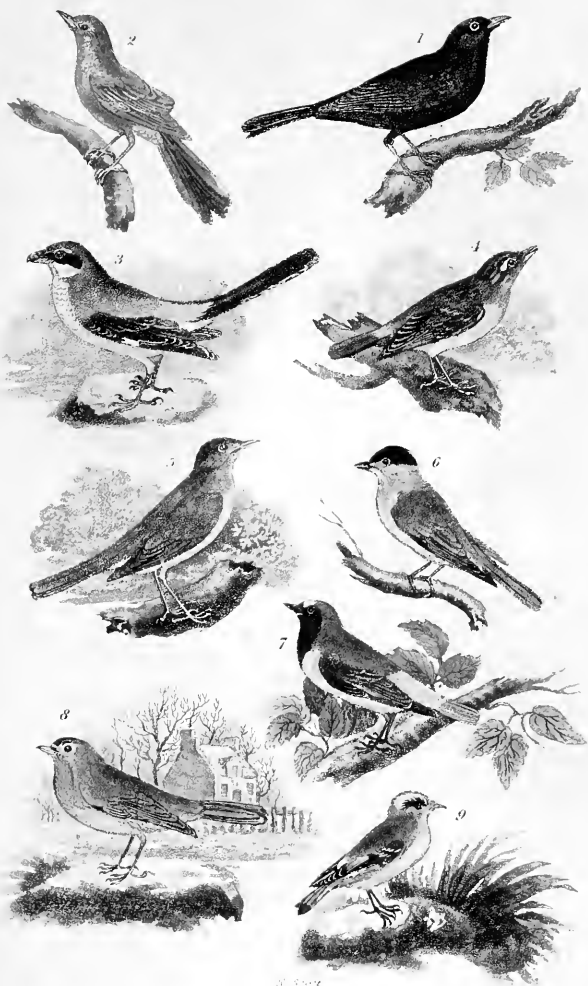
1 Malabar Horn Bill 2 Brahman Toucan 3 Grack 4 Roller 5 Golden Oriole
6 Starling 7 Bird in Paradise 8 Thrush 9 Ring Ouzel





1. Grey Wagtail. 2. Gerget Paradise Bird. 3. Yellow-billed Phalarope. 4. *Phycus Personatus*. 5. African Cuckoo. 6. Blue D. 7. Variegated Chatterer. 8. Black-throated Barbet.





1 Black Ouzel 2 Mocking Bvd. 3 Great Ash coloured Shrike. 4 Reed Plover
5 Nightingale. 6 Black Cap. 7 Redstart 8 Redbreast. 9 Golden Crested Wren.

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1. Long-Tailed Manakin. 2. Striped D°. 3. Red Flycatcher. 4. Green Tody.
5. Touracou. 6. Red-Headed Woodpecker. 7. Purple-Breasted Chatterer.
8. Carunculated D°.



1 Wren 2 White Kump 3 Whinchat 4 Stonechat 5 Winter Ewette 6 Pied Whistler
7 Yellow Wagtail 8 Woodlark 9 Titlark 10 Skylark 11 Blue Titmouse 12 Greater
Titmouse 13 Marsh Titmouse



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1 Whidah Bunting 2 Yellow Bunting 3 Black Tanager 4 Philippine Weaver
5 Cross Bill 6 Bullfinch 7 Greenfinch 8 Chaffinch 9 Grey Linnet 10 Canary Bird

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6 Parrot 7 Red-bellied Macaw 8 Alexandrine Parakeet 9 Alexandrine Parakeet



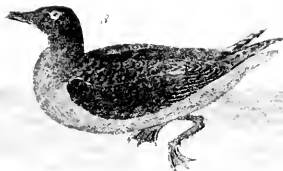


1 Greater Spotted Woodpecker. 2 Smallest Dr. 3 Wrenneck. 4 Nuthatch. 5 Creeper.
 6 Harlequin Humming Bird. 7 Red Throated Dr. 8 Hoopoe. 9 Embroidered Bee Eater.
 10 Blue headed Bee Eater. 11 Red winged Dr. 12 Common Creeper.



1 Plant cutter 2 Elegant cinagris 3 Collared Barbett 4 Xeno ps peculiaris
5 Oxyrynchus Flammiceps 6 Green Jacamar 7 White-bellied Malcocha 8 Groove
beaked Pigeonias 9 New Holland Scythrops.

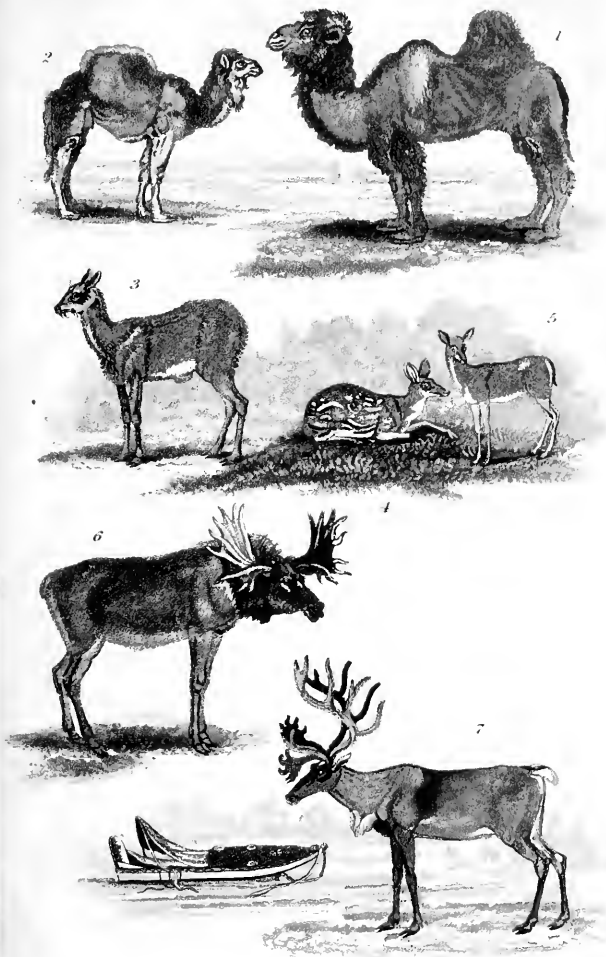




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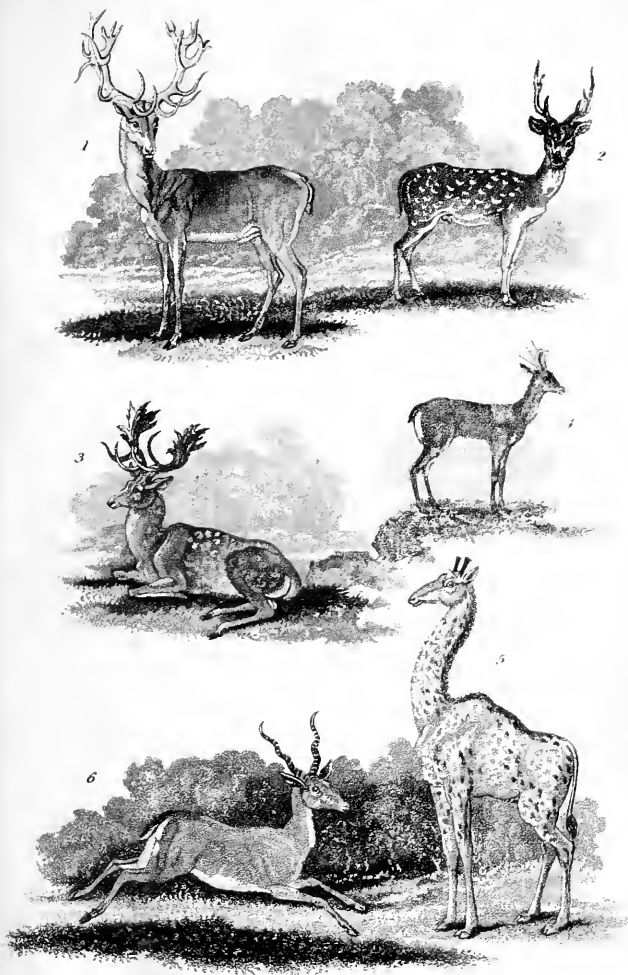
1 Eul, 2 Water Hen, 3 Great Phalarope, 4 Great Crested Grebe,
5 Rosate Tern, 6 Sabine's Gull, 7 Squab Gull





R. Scott

1 Camel. 2. Dromedary 3. Musk 4 Chevrotain 5. Manis 6 Elk 7. Reindeer.



R Scott

1 Stag 2 Ais. 3 Fallow Deer. 4 Roe Buck. 5 Cameleopard 6 Antelope



less ; some being of a lighter mixture of colours, and some being streaked in the manner of a cat.

The ichneumon, with all the strength of a cat, has more instinct and agility ; a more universal appetite for carnage, and a greater variety of powers to procure it.¹ Rats, mice, birds, serpents, lizards, and insects, are all equally pursued ; it attacks every living thing which it is able to overcome, and indiscriminately preys on flesh of all kinds. Its courage is equal to the vehemence of its appetite. It fears neither the force of the dog, nor the insidious malice of the cat ; neither the claws of the vulture, nor the poison of the viper. It makes war upon all kinds of serpents with great avidity, seizes and kills them, how venomous soever they be ; and we are told, that when it begins to perceive the effects of their rage, it has recourse to a certain root, which the Indians call after its name, and assert to be an antidote for the bite of the asp or the viper.

But what this animal is particularly serviceable to the Egyptians for, is, that it discovers and destroys the eggs of the crocodile. It also kills the young ones that have not as yet been able to reach the water ; and, as fable usually goes hand in hand with truth, it is said that the ichneumon sometimes enters the mouth of the crocodile, when it is found sleeping on the shore, boldly attacks the enemy in the inside, and at length, when it has effectually destroyed it, eats its way out again.

The ichneumon, when wild, generally resides along the banks of rivers ; and in times of inundation makes to the higher ground, often approaching inhabited places in quest of prey. It goes forward silently and cautiously, changing its manner of moving according to its necessities. Sometimes it carries the head high, shortens its body, and raises itself upon its legs ; sometimes it lengthens itself, and seems to creep along the ground ; it is often observed to sit upon its hind legs like a dog when taught to beg ; but more commonly it is seen to dart like an arrow upon its prey, and seize it with inevitable certainty. Its eyes are sprightly, and full of fire, its physiognomy sensible, its body nimble, its tail long, and its hair rough and various. Like all its kind, it has glands, that open behind, and furnish an odorous substance. Its nose is too sharp and its mouth too small to permit its seizing

¹ The rest of this description is extracted from Mr Bullon, except where marked with commas.

things that are large ; however, it makes up by its courage and activity its want of arms ; it easily strangles a cat, though stronger and larger than itself ; and often fights with dogs, which, though never so bold, learn to dread the ichneumon as a formidable enemy. It also takes the water like an otter, and, as we are told, will continue under it much longer.

This animal grows fast, and dies soon. It is found in great numbers in all the southern parts of Asia, from Egypt to Java ; and it is also found in Africa, particularly at the Cape of Good Hope. It is domestic, as was said, in Egypt, but in our colder climates it is not easy to breed or maintain them, as they are not able to support the rigour of our winters. Nevertheless, they take every precaution that instinct can dictate to keep themselves warm ; they wrap themselves up into a ball, hiding the head between the legs, and in this manner continue to sleep all day long. "Seba had one sent him from the island of Ceylon, which he permitted to run for some months about the house. It was heavy and slothful by day, and often could not be awakened even with a blow ; but it made up this indolence by its nocturnal activity, smelling about without either being wholly tame or wholly mischievous. It climbed up the walls and the trees with very great ease, and appeared extremely fond of spiders and worms, which it preferred, probably from their resemblance to serpents, its most natural food. It was also particularly eager to scratch up holes in the ground ; and this, added to its wildness and uncleanness, obliged our naturalist to smother it in spirits, in order to preserve, and add it to the rest of his collection.

This animal was one of those formerly worshipped by the Egyptians, who considered every thing that was serviceable to them as an emanation of the Deity, and worshipped such as the best representatives of God below. Indeed, if we consider the number of eggs which the crocodile lays in the sand at a time, which often amount to three or four hundred, we have reason to admire this little animal's usefulness as well as industry in destroying them, since otherwise the crocodile might be produced in sufficient numbers to overrun the whole earth.

THE STINKARDS.

THIS is a name which our sailors give to one or two animals

of the weasel kind, which are chiefly found in America. All the weasel kind, as was already observed, have a very strong smell; some of them indeed approaching to a perfume, but the greatest number most insupportably fœtid. But the smell of our weasels, and ermines, and polecats, is fragrance itself when compared to that of the *squash* and the *skink*, which have been called the *polecats* of America. These two are found in different parts of America, both differing in colour and fur, but both obviously of the weasel kind, as appears not only from their figure and odour, but also from their disposition. The *squash* is about the size of a polecat, its hair of a deep brown, but principally differing from all of this kind in having only four toes on the feet before, whereas all the other weasels have five. The *skink*, which I take to be Catesby's Virginia polecat, resembles a polecat in shape and size, but particularly differs in the length of its hair and colour. The hair is above three inches and a half long, and that at the end of the tail above four inches. The colour is partly black and partly white, variously disposed over the body, very glossy, long, and beautiful. There seem to be two varieties more of this animal, which Mr Buffon calls the *conepate* and the *zorille*. He supposes each to be a distinct species: but as they are both said to resemble the polecat in form, and both to be clothed with a long fur of a black and white colour, it seems needless to make a distinction. The *conepate* resembles the *skink* in all things except in size, being smaller, and in the disposition of its colours, which are more exact, having five white stripes upon a black ground, running longitudinally from the head to the tail. The *zorille* resembles the *skink*, but is rather smaller, and more beautifully coloured, its streaks of black and white being more distinct, and the colours of its tail being black at its insertion and white at the extremity; whereas in the *skink* they are all of one gray colour.

But whatever differences there may be in the figure or colour of these little animals, they all agree in one common affection, that of being intolerably fœtid and loathsome. I have already observed that all the weasel kind have glands furnishing an odorous matter, near the anus, the conduits of which generally have their aperture just at its opening. That substance which is stored up in these receptacles, is in some of this kind, such as in the martin already mentioned, and also in the genet and the

civet to be described hereafter, a most grateful perfume ; but in the weasel, the ermine, the ferret, and the polecat, it is extremely foetid and offensive. These glands in the animals now under consideration are much larger, and furnish a matter sublimed to a degree of putrescence that is truly amazing. As to the perfumes of musk and civet, we know that a single grain will diffuse itself over a whole house, and continue for months to spread an agreeable odour, without diminution. However, the perfume of the musk or the civet is nothing, either for strength or duration, to the insupportable odour of these. It is usually voided with their excrement ; and if but a single drop happens to touch any part of a man's garment, it is more than probable that he can never wear any part of it more.

In describing the effects produced by the excrement of these animals, we often hear of its raising this diabolical smell by its urine. However, of this I am apt to doubt ; and it should seem to me, that, as the weasel kind have their excrements so extremely foetid from the cause above mentioned, we may consider these also as being foetid from the same causes. Besides, they are not furnished with glands to give their urine such a smell ; and the analogy between them and the weasel kind being so strong in other respects, we may suppose they resemble each other in this. It has also been said, that they take this method of ejecting their excrement to defend themselves against their pursuers ; but it is much more probable that this ejection is the convulsive effect of terror, and it that serves as their defence without their own concurrence. Certain it is, that they never smell thus horridly except when enraged or affrighted, for they are often kept tame about the houses of the planters of America without being very offensive.

The habitudes of these animals are the same, living like all the rest of the weasel kind, as they prey upon smaller birds and birds' eggs. The squash, for instance, burrows like the pole-cat in the clefts of rocks, where it brings forth its young. It often steals into farm-yards, and kills the poultry, eating only their brains. Nor is it safe to pursue or offend it, for then it calls up all its scents, which are its most powerful protection. At that time neither men nor dogs will offer to approach it ; the scent is so strong that it reaches for half a mile round, and more near at hand is almost stifling. If the dogs continue to pursue, it

does all in its power to escape, by getting up a tree, or by some such means ; but if driven to an extremity, it then lets fly upon the hunters, and if it should happen that a drop of this foetid discharge falls in the eye, the person runs the risk of being blinded for ever.

The dogs themselves instantly abate of their ardour when they find this extraordinary battery played off against them ; they instantly turn tail, and leave the animal undisputed master of the field ; and no exhortations can ever bring them to rally. " In the year 1749," says Kalm, " one of these animals came near the farm where I lived. It was in winter time, during the night ; and the dogs that were upon the watch pursued it for some time, until it discharged against them.¹ Although, I was in my bed a good way off, I thought I should have been suffocated ; and the cows and oxen, by their lowings, showed how much they were affected by the stench. About the end of the same year, another of these animals crept into our cellar, but did not exhale the smallest scent because it was not disturbed. A foolish woman, however, who perceived it at night, by the shining of its eyes, killed it, and at that moment its stench began to spread. The whole cellar was filled with it to such a degree, that the woman kept her bed for several days after, and all the bread, meat, and other provisions that were kept there, were so infected, that they were obliged to be thrown out of doors." Nevertheless, many of the planters and native Americans keep this animal tame about their houses ; and seldom perceive any disagreeable scents, except it is injured or frightened. They are also known to eat its flesh, which some assert to be tolerable food ; however, they take care to deprive it of those glands which are so horribly offensive.

THE GENET.

FROM the squash, which is the most offensive animal in nature, we come to the genet, which is one of the most beautiful and pleasing. Instead of the horrid stench, with which the former affects us, this has a most grateful odour : more faint than civet, but to some for that reason more agreeable. This animal is rather less than the martin ; though there are genets of different

¹ Voyage de Kalm. as quoted by Buffon, vol. xxvii. p. 93.

sizes, and I have seen one rather larger. It also differs somewhat in the form of its body. It is not easy in words to give an idea of the distinction. It resembles all those of the weasel kind in its length, compared to its height; it resembles them in having a soft beautiful fur, in having its feet armed with claws that cannot be sheathed, and in its appetite for petty carnage. But then it differs from them in having the nose much smaller and longer, rather resembling that of a fox than a weasel. The tail, also, instead of being bushy, tapers to a point, and is much longer, its ears are larger, and its paws smaller. As to its colours and figure in general, the genet is spotted with black, upon a ground mixed with red and gray. It has two sorts of hair, the one shorter and softer, the other longer and stronger, but not above half an inch long on any part of its body except the tail. Its spots are distinct and separate upon the sides, but unite towards the back, and form black stripes, which run longitudinally from the neck backwards. It has also along the back a kind of mane or longish hair, which forms a black streak from the head to the tail, which last is marked with rings, alternately black and white its whole length.

The genet, like all the rest of the weasel kinds, has glands, that separate a kind of perfume, resembling civet, but which soon flies off. These glands open differently from those of other animals of this kind; for as the latter have their aperture just at the opening of the anus, these have their aperture immediately under it; so that the male seems, for this reason, to the superficial observer, to be of two sexes.

It resembles the martin very much in its habits and disposition;¹ except that it seems tamed much more easily. Belonius assures us, that he has seen them in the houses at Constantinople as tame as cats; and that they were permitted to run every where about, without doing the least mischief. For this reason they have been called the *cats of Constantinople*; although they have little else in common with that animal, except their skill in spying out and destroying vermin. Naturalists pretend that it inhabits only the moister grounds, and chiefly resides along the banks of rivers, having never been found in mountains, nor dry places. The species is not much diffused; it is not to be found in any part of Europe, except Spain and Turkey; it re-

1 Buffon, vol. xix. p. 167.

quires a warm climate to subsist and multiply in ; and yet it is not to be found in the warmer regions either of India, or Africa. From such as have seen its uses at Constantinople, I learn that it is one of the most beautiful, cleanly, and industrious animals in the world ; that it keeps whatever house it is in perfectly free from mice and rats, which cannot endure its smell. Add to this, its nature is mild and gentle, its colours various and glossy, its fur valuable ; and, upon the whole, it seems to be one of those animals that with proper care might be propagated amongst us, and might become one of the most serviceable of our domestics.

THE CIVET.

PROCEEDING from the smaller to the greater of this kind, we come in the last place to the civet, which is much larger than any of the former ; for as the martin is not above sixteen inches long, the civet is found to be above thirty. Mr Buffon distinguishes this species into two kinds, one of which he calls the *civet*, and the other the *zibet*. The latter principally differs from the former in having the body longer and more slender, the nose smaller, the ears longer and broader ; no mane or long hair running down the back in the latter ; and the tail longer, and better marked with rings of different colours, from one end to the other. These are the differences which have induced this great naturalist to suppose them animals of distinct species ; and to allot each a separate description. How far future experience may confirm this conjecture, time must discover ; but certain it is, that if such small varieties make a separate species, there may be many other animals equally entitled to peculiar distinction that are now classed together. We shall, therefore, content ourselves, at present, with considering, as former naturalists have done, these two merely as varieties of the same animal, and only altered in figure by climate, food, or education.

The civet resembles animals of the weasel kind in the long slenderness of its body, the shortness of its legs, the odorous matter that exudes from the glands behind, the softness of its fur, the number of its claws, and their incapacity of being sheathed. It differs from them in being much larger than any hitherto described ; in having the nose lengthened, so as to resemble that of the fox ; the tail long and tapering to a point ; and its ears

straight, like those of a cat. The colour of the civet varies : it is commonly ash, spotted with black ; though it is whiter in the female, tending to yellow ; and the spots are much larger, like those of a panther. The colour on the belly, and under the throat, is black ; whereas the other parts of the body are black or streaked with gray. This animal varies in its colour, being some times streaked, as in our kind of cats called *tabbies*. It has whiskers like the rest of its kind ; and its eye is black and beautiful.

The opening of the pouch or bag, which is the receptacle of the civet, differs from that of the rest of the weasel kind, not opening into, but under the anus. Besides this opening, which is large, there is still another lower down ; but for what purposes designed is not known. The pouch itself is about two inches and a half broad, and two long ; its opening makes a chink from the top downwards, that is about two inches and a half long ; and is covered on the edges and within, with short hair : when the two sides are drawn asunder, the inward cavity may be seen, large enough to hold a small pullet's egg ; all round this are small glands, opening and furnishing that strong perfume which is so well known, and is found in this pouch of the colour and consistence of pomatum. Those who make it their business to breed these animals for their perfume, usually take it from them twice or thrice a-week, and sometimes oftener. The animal is kept in a long sort of a box, in which it cannot turn round. The person, therefore, opens this box behind, drags the animal backwards by the tail, keeps it in this position by a bar before, and, with a wooden spoon, takes the civet from the pouch as carefully as he can ; then lets the tail go, and shuts the box again. The perfume thus procured, is put into a vessel, which he takes care to keep shut ; and when a sufficient quantity is procured, it is sold to very great advantage.

The civet,¹ although a native of the warmest climates, is yet found to live in temperate, and even cold countries, provided it be defended carefully from the injuries of the air. Wherefore, it is not only bred among the Turks, the Indians, and Africans, but great numbers of these animals are also bred in Holland, where this scraping people make no small gain of its perfume. The perfume of Amsterdam is reckoned the purest of any ; the people of other countries adulterating it with gums, and other

¹ Buffon, vol. xix.

matters, which diminish its value, but increase its weight. The quantity which a single animal affords, generally depends upon its health and nourishment. It gives more in proportion as it is more delicately and abundantly fed. Raw flesh hashed small, eggs, rice, birds, young fowls, and particularly fish, are the kinds of food the civet most delights in. These are to be changed and altered, to suit and entice its appetite, and continue its health. It gets but very little water; and although it drinks but rarely, yet it makes urine very frequently; and, upon such occasions, we cannot, as in other animals, distinguish the male from the female.

The perfume of the civet is so strong that it communicates itself to all parts of the animal's body; the fur is impregnated thereby, and the skin penetrated to such a degree that it continues to preserve the odour for a long time after it is stripped off. If a person be shut up with one of them in a close room, he cannot support the perfume, which is so copiously diffused. When the animal is irritated, as in all the weasel kind, its scent is much more violent than ordinary; and if it be tormented so as to make it sweat, this also is a strong perfume, and serves to adulterate or increase what is otherwise obtained from it. In general, it is sold in Holland for about fifty shillings an ounce; although, like all other commodities, its value alters in proportion to the demand. Civet must be chosen new, of a good consistence, a whitish colour, and a strong disagreeable smell. There is still a very considerable traffic carried on from Bus-sorah, Calicut, and other places in India, where the animal that produces it is bred; from the Levant also, from Guinea, and especially from Brasil in South America, although Mr Buffon is of opinion that the animal is a native only of the Old Continent, and not to be found wild in the New. The best civet, however, is furnished, as was observed, by the Dutch, though not in such quantities at present as some years past, when this perfume was more in fashion. Civet is a much more grateful perfume than musk, to which it has some resemblance; and was some years ago used for the same purposes in medicine. But, at present, it is quite discontinued in prescription; and persons of taste or elegance seem to proscribe it even from the toilet. Perfumes, like dress, have their vicissitudes; musk was in peculiar repute, until displaced by civet; both gave ground, upon discovering the manner of preparing ambergrise; and even this

is now disused for the less powerful vegetable kinds of fragrance, spirit of lavender or ottar of roses.

As to the rest, the civet is said to be a wild fierce animal; and although sometimes tamed, is never thoroughly familiar. Its teeth are strong and cutting, although its claws be feeble and flexible. It is light and active, and lives by prey, as the rest of its kind, pursuing birds, and other small animals that it is able to overcome. They are sometimes seen stealing into the yards and outhouses, to seize upon the poultry; their eyes shine in the night, and it is very probable that they see better in the dark than by day. When they fail of animal food, they are found to subsist upon roots and fruits, and very seldom drink; for which reason they are never found near great waters. They breed very fast in their native climates, where the heat seems to conduce to their propagation; but in our temperate latitudes, although they furnish their perfume in great quantities, yet they are not found to multiply. A proof that their perfume has no analogy with their appetite for generation.

THE GLUTTON.¹

I WILL add but one animal more to this numerous class of the weasel kind; namely, the glutton; which, for several reasons, seems to belong to this tribe, and this only. We have hitherto had no precise description of this quadruped; some resembling it to a badger, some to a fox, and some to a hyæna. Linnæus places it among the weasels, from the similitude of its teeth; it should seem to me to resemble this animal still more, from the great length of its body, and the shortness of its legs, from the softness of its fur, its disagreeable scent, and its insatiable appetite for animal food. Mr Klein, who saw one of them, which was brought alive from Siberia, assures us, that it was about three feet long,² and about a foot and a half high.

1 This animal is now ascertained to be a species of bear. It is about three feet long, besides the tail, which is a foot in length. Its size is equal to that of the common fox, though, like others of its tribe, it is of a more clumsy make, and its back is more convex. Its general colour is a blackish brown, with the sides paler. The variety called the Wolverine is distinguished by its superior size, in the colour of its body, which is dull ferruginous, with the front, throat, and longitudinal stripe on the body, whitish.

2 He says, it was an ell and eight inches long: I have, therefore, given its length, as supposing it to be a Flemish ell, which is 27 inches.

If we compare these dimensions with those of other animals, we shall find that they approach more nearly to the class we are at present describing than any other ; and that the glutton may very justly be conceived under the form of a great overgrown weasel. Its nose, its ears, its teeth, and its long bushy tail, are entirely similar ; and as to what is said of its being rather corpulent than slender, it is most probable that those who described it thus, saw it after eating, at which time its belly, we are assured, is most monstrously distended : however, suspending all certainty upon this subject, I will take leave rather to follow Linnæus than Buffon, in describing this animal ; and leave future experience to judge between them.

The glutton, which is so called from its voracious appetite, is an animal found as well in the north of Europe and Siberia, as in the northern parts of America, where it has the name of the *carcajou*. Amidst the variety of descriptions which have been given of it, no very just idea can be formed of its figure ; and, indeed, some naturalists, among whom was Ray, entirely doubted of its existence. From the best accounts, however, we have of it, the body is thick and long, the legs short ; it is black along the back, and of a reddish brown on the sides ; its fur is held in the highest estimation, for its softness and beautiful gloss ; the tail is bushy, like that of the weasel, but rather shorter ; and its legs and claws are better fitted for climbing trees, than for running along the ground. Thus far it entirely resembles the weasel ; and its manner of taking its prey is also by surprise, and not by pursuit.

Scarcely any of the animals with short legs and long bodies pursue their prey ; but, knowing their own incapacity to overtake it by swiftness, either creep upon it in its retreats, or wait in ambush and seize it with a bound. The glutton, from the make of its legs and the length of its body, must be particularly slow ; and, consequently, its only resource is in taking its prey by surprise. All the rest of the weasel kind, from the smallness of their size, are better fitted for a life of insidious rapine than this ; they can pursue their prey into its retreats, they can lurk unseen among the branches of trees, and hide themselves with ease under the leaves : but the glutton is too large to follow small prey into their retreats ; nor would such, even if obtained, be sufficient to sustain it. For these reasons,

therefore, this animal seems naturally compelled to the life for which it has long been remarkable. Its only resource is to climb a tree, which it does with great ease, and there it waits with patience until some large animal passes underneath, upon which it darts down with unerring certainty, and destroys it.

It is chiefly in North America that this voracious creature is seen lurking among the thick branches of trees, in order to surprise the deer, with which the extensive forests of that part of the world abound. Endued with a degree of patience equal to its rapacity, the glutton singles out such trees as it observes marked by the teeth or the antlers of the deer; and is known to remain there watching for several days together. If it has fixed upon a wrong tree, and finds that the deer have either left that part of the country, or cautiously shun the place, it reluctantly descends, pursues the beaver to its retreat, or even ventures into the water in pursuit of fishes. But if it happens that, by long attention and keeping close, at last the elk or the rein-deer happen to pass that way, it at once darts upon them, sticks its claws between their shoulders, and remains there unalterably firm. It is in vain that the large frightened animal increases its speed, or threatens with its branching horns; the glutton having taken possession of its post, nothing can drive it off; its enormous prey drives rapidly along amongst the thickest woods, rubs itself against the largest trees, and tears down the branches with its expanded horns; but still its insatiable foe sticks behind, eating its neck, and digging its passage to the great blood-vessels that lie in that part. Travellers who wander through those deserts, often see pieces of the glutton's skin sticking to the trees, against which it was rubbed by the deer. But the animal's voracity is greater than its feelings, and it never seizes without bringing down its prey. When, therefore, the deer, wounded and feeble with the loss of blood, falls, the glutton is seen to make up for its former abstinence by its present voracity. As it is not possessed of a feast of this kind every day, it resolves to lay in a store to serve it for a good while to come. It is, indeed, amazing how much one of these animals can eat at a time! That which was seen by Mr Klein, although without exercise or air, although taken from its native climate, and enjoying but an indifferent state of health, was yet seen to eat thirteen pounds of flesh every day, and yet remain unsatisfied. We

may, therefore, easily conceive how much more it must devour at once, after a long fast, of a food of its own procuring, and in the climate most natural to its constitution. We are told, accordingly, that from being a lank, thin animal, which it naturally is, it then gorges in such quantities, that its belly is distended, and its whole figure seems to alter. Thus voraciously it continues eating, till, incapable of any other animal function, it lies totally torpid by the animal it has killed: and in this situation continues for two or three days. In this loathsome and helpless state, it finds its chief protection from its horrid smell, which few animals care to come near;¹ so that it continues eating and sleeping till its prey be devoured, bones and all, and then it mounts a tree, in quest of another adventure.

The glutton, like many others of the weasel kind, seems to prefer the most putrid flesh to that newly killed; and such is the voraciousness of this hateful creature, that, if its swiftness and strength were equal to its rapacity, it would soon thin the forest of every other living creature. But, fortunately, it is so slow, that there is scarcely a quadruped that cannot escape it, except the beaver. This, therefore, it very frequently pursues upon land; but the beaver generally makes good its retreat by taking to the water, where the glutton has no chance to succeed. This pursuit only happens in summer; for in the winter all that remains is to attack the beaver's house, as at that time it never stirs from home. This attack, however, seldom succeeds; for the beaver has a covert way bored under the ice, and the glutton has only the trouble and disappointment of sacking an empty town.

A life of necessity generally produces a good fertile invention. The glutton, continually pressed by the call of appetite, and having neither swiftness nor activity to satisfy it, is obliged to make up by stratagem the defects of nature. It is often seen to examine the traps and the snares laid for other animals, in order to anticipate the fowlers. It is said to practise a thousand arts to procure its prey, to steal upon the retreats of the rein-deer, the flesh of which animal it loves in preference to all others; to lie in wait for such animals as have been maimed by the hunters; to pursue the isatis while it is hunting for itself; and when that animal has run down its prey, to come in and seize up-

¹ Linnæi Systema, p. 67.

on the whole, and sometimes to devour even its poor provider; and when these pursuits fail, even to dig up the graves, and fall upon the bodies interred there, devouring them bones and all. For these reasons, the natives of the countries where the glutton inhabits, hold it in utter detestation, and usually term it the vulture of quadrupeds. And yet it is extraordinary enough, that being so very obnoxious to man it does not seem to fear him. We are told by Gmelin of one of those coming up boldly and calmly where there were several persons at work, without testifying the smallest apprehension, or attempting to run, until it had received several blows, that at last totally disabled it. In all probability it came among them seeking its prey; and, having been used to attack animals of inferior strength, it had no idea of a force superior to its own. The glutton, like all the rest of its kind, is a solitary animal, and is never seen in company except with its female, with which it couples in the midst of winter. The latter goes with young about four months, and brings forth two or three at a time.² They burrow in holes as the weasel; and the male and female are generally found together, both equally resolute in defence of their young. Upon this occasion the boldest dogs are afraid to approach them; they fight obstinately, and bite most cruelly. However, as they are unable to escape by flight, the hunters come to the assistance of the dogs, and easily overpower them. Their flesh, it may readily be supposed, is not fit to be eaten, but the skins amply recompense the hunters for their toil and danger. The fur has the most beautiful lustre that can be imagined, and is preferred before all others except the Siberian fox, or the sable. Among other peculiarities of this animal Linnæus informs us, that it is very difficult to be skinned; but from what cause, whether its abominable stench, or the skin's tenacity to the flesh, he has not thought fit to inform us.

1 Buffon.

2 Linnæus Systema, p. 66.

BOOK V.

ANIMALS OF THE HARE KIND.¹

INTRODUCTION.

HAVING described in the last chapter a tribe of minute, fierce, rapacious animals, I come now to a race of minute animals of a more harmless and gentle kind, that, without being enemies to any, are preyed upon by all. As Nature has fitted the former for hostility, so it has entirely formed the latter for evasion ; and as the one kind subsist by their courage and activity, so the other find safety from their swiftness and their fears. The hare is the swiftest animal in the world for the time it continues ; and few quadrupeds can overtake even the rabbit, when it has but a short way to run. To this class also we may add the squirrel, somewhat resembling the hare and rabbit in its form and nature, and equally pretty, inoffensive, and pleasing.

If we were methodically to distinguish animals of the hare kind from all others, we might say that they have but two cutting teeth above and two below, that they are covered with a soft downy fur, and that they have a bushy tail. The combination of these marks might perhaps distinguish them tolerably well, whether from the rat, the beaver, the otter, or any other most nearly approaching in form. But, as I have declined all method that rather tends to embarrass history than enlighten it, I am contented to class these animals together for no very precise reason, but because I find a general resemblance between them in their natural habits, and in the shape of their heads and body. I call a squirrel an animal of the hare kind, because it is something like a hare. I call the paca of the same kind, merely because it is more like a rabbit than any other animal I know of. In short, it is fit to erect some particular standard in the imagination of

¹ The animals of this family have two front teeth in each jaw ; those in the upper jaw are doubled, having two smaller ones standing behind the others : they feed entirely on vegetables, are very small, and run by a kind of leaping : they have five toes on the fore-feet, and four on the hinder.

the reader, to refer him to some animal that he knows, in order to direct him in conceiving the figure of such as he does not know. Still, however, he should be apprised that his knowledge will be defective without an examination of each particular species; and that saying an animal is of this or that particular kind, is but a very trifling part of its history.

Animals of the hare kind, like all others that feed entirely upon vegetables, are inoffensive and timorous. As Nature furnishes them with a most abundant supply, they have not that rapacity after food remarkable in such as are often stinted in their provision. They are extremely active and amazingly swift, to which they chiefly owe their protection; for being the prey of every voracious animal, they are incessantly pursued. The hare, the rabbit, and the squirrel, are placed by Pyerius, in his Treatise of Ruminating Animals, among the number of those that chew the cud; but how far this may be true I will not pretend to determine. Certain it is that their lips continually move whether sleeping or waking. Nevertheless they chew their meat very much before they swallow it, and for that reason I should suppose that it does not want a second mastication. All these animals use their fore-paws like hands; they are remarkably salacious, and are furnished by Nature with more ample powers than most others for the business of propagation. They are so very prolific, that were they not thinned by the constant depredations made upon them by most other animals, they would quickly over-run the earth.

THE HARE.

Of all these the hare is the largest, the most persecuted, and the most timorous; all its muscles are formed for swiftness; and all its senses seem only given to direct its flight. It has very large prominent eyes, placed backwards in its head, so that it can almost see behind it as it runs. These are never wholly closed; but as the animal is continually upon the watch, it sleeps with them open. The ears are still more remarkable for their size; they are moveable, and capable of being directed to every quarter; so that the smallest sounds are readily received, and the animal's motions directed accordingly. The muscles of the body are very strong, and without fat, so that it may be said

to carry no superfluous burden of flesh about it; the hinder feet are longer than the fore, which still adds to the rapidity of its motions; and almost all animals that are remarkable for their speed, except the horse, are formed in the same manner.

An animal so well formed for a life of escape, might be supposed to enjoy a state of tolerable security; but as every rapacious creature is its enemy, it but very seldom lives out its natural term. Dogs of all kinds pursue it by instinct, and follow the hare more eagerly than any other animal. The cat and the weasel kinds are continually lying in ambush, and practising all their little arts to seize it; birds of prey are still more dangerous enemies, as against them no swiftness can avail, nor retreat secure; but man, an enemy far more powerful than all, prefers its flesh to that of other animals, and destroys greater numbers than all the rest. Thus pursued and persecuted on every side, the race would long since have been totally extirpated, did it not find a resource in its amazing fertility.

The hare multiplies exceedingly; it is in a state of engendering at a few months old; the female goes with young but thirty days, and generally brings forth three or four at a time.¹ As soon as they have produced their young, they are again ready for conception, and thus do not lose any time in continuing the breed. But they are in another respect fitted in an extraordinary manner for multiplying their kind; for the female, from the conformation of her womb, is often seen to bring forth, and yet to continue pregnant at the same time; or, in other words, to have young ones of different ages in her womb together. Other animals never receive the male when pregnant, but bring forth their young at once. But it is frequently different with the hare; the female often, though already impregnated, admitting the male, and thus receiving a second impregnation. The reason of this extraordinary circumstance is, that the womb in these animals is divided in such a manner that it may be considered as a double organ, one side of which may be filled while the other remains empty. Thus these animals may be seen to couple at every period of their pregnancy, and even while they are bringing forth young, laying the foundation of another brood.

The young of these animals are brought forth with their eyes

¹ Buffon, vol. xiii. p. 12.

open, and the dam suckles them for twenty days, after which they leave her, and seek out for themselves.¹ From this we observe, that the education these animals receive is but trifling, and the family connection but of a short duration. In the rapacious kinds the dam leads her young forth for months together; teaches them the arts of rapine; and, although she wants milk to supply them, yet keeps them under her care until they are able to hunt for themselves. But a long connection of this kind would be very unnecessary as well as dangerous to the timid animals we are describing; their food is easily procured; and their associations, instead of protection, would only expose them to their pursuers. They seldom, however, separate far from each other, or from the place where they were produced; but make each a form at some distance, having a predilection rather for the place than each other's society. They feed during the night rather than by day, choosing the more tender blades of grass, and quenching their thirst with the dew. They live also upon roots, leaves, fruits, and corn, and prefer such plants as are furnished with a milky juice. They also strip the bark of trees during the winter, there being scarcely any that they will not feed on, except the lime or the alder. They are particularly fond of birch, pinks, and parsley. When they are kept tame, they are fed with lettuce and other garden herbs; but the flesh of such as are thus brought up is always indifferent.

They sleep or repose in their forms by day, and may be said to live only by night.² It is then that they go forth to feed and couple. They do not pair, however, but in the rutting season, which begins in February; the male pursues and discovers the female by the sagacity of its nose. They are then seen by moonlight, playing, skipping, and pursuing each other; but the least motion, the slightest breeze, the falling of a leaf, is sufficient to disturb their revels; they instantly fly off, and each takes a separate way.

As their limbs are made for running, they easily outstrip all other animals in the beginning; and could they preserve their speed, it would be impossible to overtake them; but as they exhaust their strength at their first efforts, and double back to the place they were started from, they are more easily taken

¹ Buffon, vol. xiii. p. 12.

² *Ibid.*

than the fox, which is a much slower animal than they. As their hind legs are longer than the fore, they always choose to run up hill, by which the speed of their pursuers is diminished, while theirs remains the same. Their motions are also without any noise, as they have the sole of the foot furnished with hair; and they seem the only animals that have hair on the inside of their mouths.

They seldom live above seven or eight years at the utmost: they come to their full perfection in a year; and this multiplied by seven, as in other animals, gives the extent of their lives.¹ It is said, however, that the females live longer than the males; of this Mr Buffon makes a doubt; but I am assured that it is so. They pass their lives, in our climate, in solitude and silence; and they seldom are heard to cry, except when they are seized or wounded. Their voice is not so sharp as the note of some other animals, but more nearly approaching that of the squalling of a child. They are not so wild as their dispositions and their habits seem to indicate; but are of a complying nature, and easily susceptible of a kind of education. They are easily tamed. They even become fond and caressing, but they are incapable of attachment to any particular person, and never can be depended upon; for, though taken never so young, they regain their native freedom at the first opportunity. As they have a remarkably good ear, and sit upon their hind legs, and use their fore-paws as hands, they have been taught to beat the drum, to dance to music, and go through the manual exercise.

But their natural instincts for their preservation are much more extraordinary than those artificial tricks that are taught them. They make themselves a form, particularly in those places where the colour of the grass most resembles that of their skin; it is open to the south in winter, and to the north in summer. The hare, when it hears the hounds at a distance, flies for some time through a natural impulse, without managing its strength, or consulting any other means but speed for its safety. Having attained some hill or rising ground, and left the dogs so far behind that it no longer hears their cries, it stops, rears on its hinder legs, and at length looks back to see if it has not lost its pursuers. But these, having once fallen upon the

1 Buffon, vol. xiii. p. 12.

scent, pursue slowly and with united skill, and the poor animal soon again hears the fatal tidings of their approach. Sometimes when sore hunted it will start a fresh hare, and squat in the same form; sometimes it will creep under the door of a sheep-cot, and hide among the sheep; sometimes it will run among them, and no vigilance can drive it from the flock; some will enter holes like the rabbit, which the hunters call going to *vault*; some will go up one side of the hedge and come down the other; and it has been known that a hare sorely hunted has got upon the top of a quick-set hedge, and run a good way thereon, by which it has effectually evaded the hounds. It is no unusual thing also for them to betake themselves to furze bushes, and to leap from one to another, by which the dogs are frequently misled. However, the first doubling a hare makes is generally a key to all its future attempts of that kind, the latter being exactly like the former. The young hares tread heavier, and leave a stronger scent than the old, because their limbs are weaker; and the more this forlorn creature tires, the heavier it treads, and the stronger is the scent it leaves. A buck, or male hare, is known by its choosing to run upon hard highways, feeding farther from the wood-sides, and making its doubling of a greater compass than the female. The male having made a turn or two about its form, frequently leads the hounds five or six miles on a stretch; but the female keeps close by some covert side, turns, crosses, and winds among the bushes like a rabbit, and seldom runs directly forward. In general, however, both male and female regulate their conduct according to the weather. In a moist day they hold by the highways more than at any other time, because the scent is then strongest upon the grass. If they come to the side of a grove or spring, they forbear to enter, but squat down by the side thereof until the hounds have overshot them; and then, turning along their former path, make to their old form, from which they vainly hope for protection.*

* An old hare, when hunted by a common hound, seems to regulate her flight from the very first according to the speed of her pursuer. She seems to know from experience, that very rapid flight would be less certain of carrying her out of the reach of danger than a more deliberate one, whereby the chase is protracted to a greater length of time, and she can continue the exertion of her strength longer than if she exerted her full speed at first. She seems to have observed, that in grounds where there are many young shrubs, the contact of her body leaves behind her a stronger scent, and one

Hares are divided, by the hunters, into mountain and measled hares. The former are more swift, vigorous, and have the flesh better tasted; the latter chiefly frequent the marches, when bunted keep among low grounds, and their flesh is moist, white, and flabby. When the male and female keep one particular spot, they will not suffer any strange hare to make its form in the same quarter; so that it is usually said, that the more you hunt, the more hares you shall have; for, having killed one hare, others come and take possession of its form. Many of these animals are found to live in woods and thickets, but they are naturally fond of the open country, and are constrained only by fear to take shelter in places that afford them neither a warm sun nor an agreeable pasture. They are therefore usually seen stealing out of the hedges of the wood to taste the grass that grows shorter and sweeter in the open fields than under the shade of the trees; however, they seldom miss of being pursued; and every excursion is a new adventure. They are shot at by poachers; traced by their footsteps in the snow; caught in springs; dogs, birds, and cats, are all combined against them; ants, snakes, and adders, drive them from their forms, especially in summer; even fleas, from which most other animals are free, persecute this poor creature; and so various are its enemies, that it is seldom permitted to reach even that short term to which it is limited by nature.

The soil and climate have their influence upon this animal, as well as on most others. In the countries bordering on the north pole, they become white in winter, and are often seen in great troops of four or five hundred, running along the banks of the Irish, or the Jenisca, and are as white as the snow they tread

which makes the dogs pursue her with much greater ardour and perseverance than in level plains, over which the wind skims but slightly. She therefore avoids all thickets, and keeps as much as possible upon beaten roads; but when she is pursued by greyhounds, she runs from them as fast as she is able, and seeks for shelter in woods and thickets.

Knowing that harriers, even though they do not see her, can follow her track, she often practises an admirable stratagem to deceive them. When she has run on a considerable way in a straight line, she returns a small distance upon the road she has come, in order to render the scent very strong upon this space of the ground: she then makes several long leaps in a side direction, and thereby renders it difficult for the hounds to recover the scent. By this means the hounds are often put at fault, and the hare enabled to get considerably a-head of them.

on. They are caught in traps for the sake of their skins, which, on the spot, are sold for less than seven shillings a hundred. Their fur is well known to form a considerable article in the hat manufacture; and we accordingly import vast quantities of it from those countries where the hare abounds in such plenty. They are found also entirely black, but these in much less quantities than the former;¹ and even some have been seen with horns, though these but rarely.²

The hares of the hot countries, particularly in Italy, Spain, and Barbary, are smaller than ours: those bred in the Milanese country are said to be the best in Europe.³ There is scarcely a country where this animal is not to be found, from the torrid zone to the neighbourhood of the polar circle. The natives of Guinea knock them on the head as they come down to the sides of the rivers to drink. They also surround the place where they are seen in numbers, and clattering a short stick, which every man carries, against that which the person next him carries, they diminish their circle gradually, till the hares are cooped up in the midst. They then altogether throw their sticks in among them, and with such deadly force, that they seldom fail of killing great numbers at a time.⁴

The flesh of this animal has been esteemed a delicacy among some nations, and it is held in detestation by others. The Jews, the ancient Britons, and the Mahometans, all considered it as an unclean animal, and religiously abstained from it. On the contrary, there are scarce any other people, however barbarous at present, that do not consider it as the most agreeable food. Fashion seems to preside and govern all the senses; what mankind at one time consider as beautiful, fragrant, or savoury, may at another time, or among other nations, be regarded as deformed, disgustful, or ill-tasted. That flesh which the ancient Romans so much admired as to call it the food of the wise, was, among the Jews and the Druids, thought unfit to be eaten; and even the moderns, who, like the Romans, consider the flesh of this animal as a delicacy, have very different ideas as to dressing it. With us it is simply served up without much seasoning; but Apicius shows us the manner of dressing a hare

1 Klein, Disp. Quadrup. p. 52.

2 Johnston de Quadrup. l. ii. c. 2.

3 Dictionnaire Raisonnee Lievre.

4 Hist. Gen. des Voyages, tom. iv. p. 171.

in true Roman taste, with parsley, rice, vinegar, cummin seed, and coriander.⁵

THE RABBIT.

THE hare and the rabbit, though so very nearly resembling each other in form and disposition, are yet distinct kinds, as they refuse to mix with each other. Mr Buffon bred up several of both kinds in the same place; but from being at first indifferent, they soon became enemies; and their combats were generally continued until one of them was disabled or destroyed. However, though these experiments were not attended with success, I am assured that nothing is more frequent than an animal bred between these two, but which, like the mule, is marked with sterility. Nay, it has been actually known that the rabbit couples with animals of a much more distant nature; and there is at present in the Museum at Brussels, a creature covered with feathers and hair, and said to be bred between a rabbit and a hen. The fecundity of the rabbit is still greater than that of the hare; and if we should calculate the produce from a single pair in one year, the number would be amazing. They breed seven times in a year, and bring eight young ones each time. On a supposition, therefore, that this happens regularly, at the end of four years a couple of rabbits shall see a progeny of almost a million and a half. From hence we must justly apprehend being overstocked by their increase; but, happily for mankind, their enemies are numerous, and their nature inoffensive; so that their destruction bears a near proportion to their fertility.

But although their numbers be diminished by every beast and bird of prey, and still more by man himself, yet there is no danger of their extirpation. The hare is a poor defenceless animal, that has nothing but its swiftness to depend on for safety; its numbers are, therefore, every day decreasing; and in countries that are well peopled, the species are so much kept under, that laws are made for their preservation. Still, however, it is most likely that they will be at last totally destroyed; and, like the wolf or the elk in some countries, be only kept in remembrance. But it is otherwise with the rabbit, its fecundity being greater,

⁵ Vid. Apicii, &c.

and its means of safety more certain. The hare seems to have more various arts and instincts to escape its pursuers, by doubling, squatting, and winding; the rabbit has but one art of defence alone, but in that one finds safety, by making itself a hole, where it continues a great part of the day, and breeds up its young; there it continues secure from the fox, the hound, the kite, and every other enemy.

Nevertheless, though this retreat be safe and convenient, the rabbit does not seem to be naturally fond of keeping there. It loves the sunny field and the open pasture; it seems to be a chilly animal, and dislikes the coldness of its under-ground habitation. It is, therefore, continually out, when it does not fear disturbance; and the female often brings forth her young at a distance from the warren, in a hole, not above a foot deep at the most. There she suckles them for about a month, covering them over with moss and grass, whenever she goes to pasture, and scratching them up at her return. It has been said, indeed, that this shallow hole without the warren is made lest the male should attack and destroy her young; but I have seen the male himself attend the young there, lead them out to feed, and conduct them back upon the return of the dam. This external retreat seems a kind of country house, at a distance from the general habitation; it is usually made near some spot of excellent pasture, or in the midst of a field of sprouting corn. To this both male and female often retire from the warren, lead their young by night to the food which lies so convenient, and, if not disturbed, continue there till they are grown up. There they find a greater variety of pasture than near the warren, which is generally eaten bare; and enjoy a warmer sun, by covering themselves up in a shallower hole. Whenever they are disturbed, they then forsake their retreat of pleasure for one of safety; they fly to the warren with their utmost speed; and if the way be short, there is scarcely any dog, how swift soever, that can overtake them.

But it does not always happen that these animals are possessed of one of these external apartments; they most usually bring forth their young in the warren, but always in a hole, separate from the male. On these occasions, the female digs herself a hole,¹ different from the ordinary one, by being more intricate;

1 Buffon.

at the bottom of which she makes a more ample apartment. This done, she pulls off from her belly a good quantity of her hair, with which she makes a kind of bed for her young. During the two first days she never leaves them; and does not stir out but to procure nourishment, which she takes with the utmost despatch; in this manner suckling her young for near six weeks until they are strong, and able to go abroad themselves. During all this time, the male seldom visits their separate apartments; but when they are grown up, so as to come to the mouth of the hole, he then seems to acknowledge them as his offspring, takes them between his paws, smoothes their skin, and licks their eyes; all of them, one after the other, have an equal share in his caresses.

In this manner the rabbit, when wild, consults its pleasure and its safety; but those that are bred up tame, do not take the trouble of digging a hole, conscious of being already protected. It has also been observed,¹ that when people, to make a warren, stock it with tame rabbits, these animals, having been unaccustomed to the art of scraping a hole, continue exposed to the weather, and every other accident, without ever burrowing. Their immediate offspring also are equally regardless of their safety: and it is not till after two or three generations that these animals begin to find the necessity and convenience of an asylum, and practise an art which they could only learn from nature.

Rabbits of the domestic breed, like all other animals that are under the protection of man, are of various colours; white, brown, black, and mouse-colour. The black are the most scarce; the brown, white, and mouse-colour, are in greater plenty. Most of the wild rabbits are of a brown, and it is the colour which prevails among the species; for in every nest of rabbits, whether the parents be black or white, there are some brown ones found of the number. But, in England, there are many warrens stocked with the mouse-colour kinds, which some say came originally from an island in the river Humber, and which still continue their original colour, after a great number of successive generations. A gentleman,² who bred up tame rabbits for his amusement, gives the following account of their production: "I began," says he, "by having but one male and female only; the male was entirely white, and the female brown; but,

1 Buffon.

2 Mr Moutier, as quoted by Mr Buffon.

in their posterity, the number of the brown by far exceeded those of any other colour: there were some white, some particoloured, and some black. It is surprising how much the descendants were obedient and submissive to their common parent; he was easily distinguished from the rest by his superior whiteness; and, however numerous the other males were, this kept them all in subjection. Whenever they quarrelled among each other, either for their females or provisions, as soon as he heard the noise, he ran up to them with all despatch, and, upon his appearance, all was instantly reduced to peace and order. If he caught any of them in the fact, he instantly punished them, as an example to the rest. Another instance of his superiority was, that having accustomed them to come to me with the call of a whistle, the instant this signal was given I saw him marshalling them up, leading them the foremost, and then suffering them all to file off before him."

The rabbit,¹ though less than the hare, generally lives longer. As these animals pass the greater part of their lives in their burrow, where they continue at ease and unmolested, they have nothing to prevent the regularity of their health, or the due course of their nourishment. They are, therefore, generally found fatter than the hare; but their flesh is, notwithstanding, much less delicate. That of the old ones, in particular, is hard, tough, and dry; but it is said, that in warmer countries they are better tasted. This may very well be, as the rabbit, though so very plentiful in Great Britain and Ireland, is nevertheless a native of the warmer climates; and has been originally imported into these kingdoms from Spain. In that country, and in some of the islands in the Mediterranean, we are told that they once multiplied in such numbers as to prove the greatest nuisance to the natives. They at first demanded military aid to destroy them; but soon after they called in the assistance of ferrets, which originally came from Africa, and these, with much more ease and expedition, contrived to lessen the calamity. In fact, rabbits are found to love a warm climate, and to be incapable of bearing the cold of the north; so that in Sweden they are obliged to be littered in the houses. It is otherwise in all the tropical climates, where they are extremely common, and where they seldom burrow, as with us. The English counties that are

¹ Mr Moutier, as quoted by Mr Buffon.

most noted for these animals, are Lincolnshire, Norfolk, and Cambridgeshire. They delight in grounds of a sandy soil, which are warmer than those of clay; and which also furnish a softer and finer pasture.

The tame rabbits are larger than the wild ones, from their taking more nourishment, and using less exercise; but their flesh is not so good, being more insipid and softer. In order to improve it, they are chiefly fed upon bran, and are stinted in their water; for if indulged in too great plenty of moist food, they are apt, as the feeders express it, to grow rotten. The hair or fur is a very useful commodity, and is employed in England for several purposes, as well when the skin is dressed with it on, as when it is pulled off. The skins, especially the white, are used for lining clothes, and are considered as a cheap imitation of ermine. The skin of the male is usually preferred, as being the most lasting, but it is coarser; that on the belly, in either sex, is the best and finest. But the chief use made of rabbit's fur is in the manufacture of hats; it is always mixed, in certain proportions, with the fur of the beaver; and it is said to give the latter more strength and consistence.

The Syrian rabbit, like all other animals bred in that country, is remarkable for the length of its hair; it falls along the sides in wavy wreaths, and is in some places curled at the end, like wool; it is shed once a year in large masses; and it often happens that the rabbit, dragging a part of its robe on the ground, appears as if it had got another leg, or a longer tail. There are no rabbits naturally in America; however those that have been carried from Europe, are found to multiply in the West India islands in great abundance. In other parts of that continent, they have animals that in some measure resemble the rabbits of Europe; and which most European travellers have often called *hares* or *rabbits*, as they happened to be large or small. Their giving them even the name will be a sufficient excuse for my placing them among animals of the hare kind; although they may differ in many of the most essential particulars. But before we go to the new continent, we will first examine such as bear even a distant resemblance to the hare kind at home.

THE SQUIRREL.

THERE are few readers that are not so well acquainted with the figure of a Squirrel as that of the rabbit ; but supposing it unknown to any, we might give them some idea of its form, by comparing it to a rabbit, with shorter ears, and a longer tail. The tail indeed, is alone sufficient to distinguish it from all others, as it is extremely long, beautiful, and bushy, spreading like a fan, and which, when thrown up behind, covers the whole body. This serves the little animal for a double purpose ; when erected, it serves, like an umbrella, as a secure protection from the injuries of the heat and cold ; and when extended, it is very instrumental in promoting those vast leaps that the squirrel takes from tree to tree ; nay, some assert that it answers still a third purpose, and when the squirrel takes the water, which it sometimes does upon a piece of bark, that its tail serves it instead of a sail.²

There are few wild animals in which there are so many varieties as in the squirrel. The *common squirrel* is of the size of a small rabbit, and is rather of a more reddish brown. The belly and breast are white ; and the ears beautifully ornamented with long tufts of hair, of a deeper colour than that on the body. The eyes are large, black, and lively ; the legs are short and muscular, like those of the rabbit ; but the toes longer, and the claws sharper, so as to fit it for climbing. When it eats, or dresses itself, it sits erect, like the hare or rabbit, making use of its fore-legs as hands ; and chiefly resides in trees. The *gray Virginian squirrel*, which Mr Buffon calls the *petit gris*, is larger than a rabbit, and of a grayish colour. Its body and limbs are thicker than those of the common squirrel ; and its ears are shorter, and without tufts at the point. The upper part of the body, and external part of the legs, are of a fine whitish gray, with a beautiful red streak on each side lengthways. The tail is covered with very long gray hair, variegated with black and white towards the extremity. This variety seems to be common to both continents ; and in Sweden is seen

¹ This elegant tribe of quadrupeds have two front teeth in each jaw ; those in the upper jaw being wedge-shaped, those in the lower pointed : on each side in the upper jaw there are five grinders, and four in the lower : they have perfect collar bones, and in most species the tail is shed on each side.

² Klein. Linnæus.

to change colour in winter. The *Barbary squirrel*, of which Mr Buffon makes three varieties, is of a mixed colour, between red and black. Along the sides there are white and brown lines, which render this animal very beautiful; but what still adds to its elegance is that the belly is of a sky blue, surrounded with white. Some of these hold up their tail erect; and others throw it forward over their body. The *Siberian white squirrel* is of the size of a common squirrel. The *Carolina black squirrel* is much bigger than the former, and sometimes tipped with white at all the extremities. The *Brasilian squirrel*, which Mr Buffon calls the *coquallin*, is a beautiful animal of this kind, and very remarkable for the variety of its colours. Its belly is of a bright yellow; its head and body variegated with white, black, brown, and orange colour. It wants the tufts at the extremity of its ears; and does not climb trees, as most of the kind are seen to do. To this list may be added the *little ground squirrel of Carolina*, of a reddish colour, and blackish stripes on each side; and, like the former, not delighting in trees. Lastly, the *squirrel of New Spain*, which is of a deep iron-grey colour, with seven longitudinal whitish streaks along the sides of the male, and five along those of the female. As for the flying squirrels, they are a distinct kind, and shall be treated of by themselves.

These, which I suppose to be but a few of the numerous varieties of the squirrel, sufficiently serve to show how extensive this animal is diffused over all parts of the world. It is not to be supposed, however, that every variety is capable of sustaining every climate; for few animals are so tender, or so little able to endure a change of abode, as this. Those bred in the tropical climates, will only live near a warm sun; while, on the contrary, the squirrel of Siberia will scarce endure the temperature of ours. These varieties do not only differ, in their constitutions and colour; but in their dispositions also; for while some live on the tops of trees, others feed, like rabbits, on vegetables below. Whether any of these, so variously coloured, and so differently disposed, would breed among each other, we cannot tell: and since, therefore, we are left in uncertainty upon this point, we are at liberty either to consider each as a distinct species by itself; or only a variety, that accident might have originally produced, and that the climate or soil might have continued. For my own part, as the original character of the squirrel is so

strongly marked upon them all, I cannot help considering them in the latter point of view ; rather as the common descendants of one parent, than originally formed with such distinct similitudes.

The squirrel is a beautiful little animal,¹ which is but half savage ; and which, from the gentleness and innocence of its manners, deserves our protection. It is neither carnivorous nor hurtful : its usual food is fruits, nuts, and acorns ; it is cleanly, nimble, active, and industrious ; its eyes are sparkling, and its physiognomy marked with meaning. It generally, like the hare and rabbit, sits up on its hinder legs, and uses the fore-paws as hands ; these have five *claws* or *toes*, as they are called, and one of them is separated from the rest like a thumb. This animal seems to approach the nature of birds, from its lightness, and surprising agility on the tops of trees. It seldom descends to the ground, except in case of storms, but jumps from one branch to another ; feeds, in spring, on the buds and young shoots ; in summer, on the ripening fruits, and particularly the young cones of the pine-tree. In autumn it has an extensive variety to feast upon ; the acorn, the filbert, the chesnut, and the wilding. This season of plenty, however, is not spent in idle enjoyment ; the provident little animal gathers at that time its provisions for the winter ; and cautiously foresees the season when the forest shall be stripped of its leaves and fruitage.

Its nest is generally formed among the large branches of a great tree, where they begin to fork off into small ones. After choosing the place where the timber begins to decay, and a hollow may the more easily be formed, the squirrel begins by making a kind of level between the forks ; and then bringing moss, twigs, and dry leaves, it binds them together with great art, so as to resist the most violent storm. This is covered up on all sides ; and has but a single opening at top, which is just large enough to admit the little animal ; and this opening is itself defended from the weather by a kind of canopy, made in the fashion of a cone, so that it throws off the rain, though never so heavy. The nest thus formed, with a very little opening above, is, nevertheless, very commodious and roomy below ; soft, well knit together, and every way convenient and warm. In this retreat the little animal brings forth its young, shelters itself from

¹ Buffon.

the scorching heat of the sun, which it seems to fear, and from the storms and inclemency of winter, which it is still less capable of supporting. Its provision of nuts and acorns is seldom in its nest, but in the hollows of the tree, laid up carefully together, and never touched but in cases of necessity. Thus one single tree serves for a retreat and a storehouse; and without leaving it during the winter, the squirrel possesses all those enjoyments that its nature is capable of receiving. But it sometimes happens that its little mansion is attacked by a deadly and powerful foe. The martin goes often in quest of a retreat for its young, which it is incapable of making for itself; for this reason it fixes upon the nest of a squirrel, and, with double injustice, destroys the tenant, and then takes possession of the mansion.

However, this is a calamity that but seldom happens: and, of all other animals, the squirrel leads the most frolicsome playful life, being surrounded with abundance, and having few enemies to fear. They are in heat early in spring; when, as a modern naturalist says,* it is very diverting to see the female feigning an escape from the pursuit of two or three males, and to observe the various proofs which they give of their agility, which is then exerted in full force. Nature seems to have been particular in her formation of these animals for propagation: however, they seldom bring forth above four or five young at a time; and that but once a year. The time of their gestation seems to be about six weeks; they are pregnant in the beginning of April, and bring forth about the middle of May.

The squirrel is never found in the open fields, nor yet in copses or underwoods: it always keeps in the midst of the tallest trees, and, as much as possible, shuns the habitations of men. It is extremely watchful; if the tree in which it resides be hut touched at the bottom, the squirrel instantly takes the alarm, quits its nest, at once flies off to another tree, and thus travels, with great ease, along the tops of the forest, until it finds itself perfectly out of danger. In this manner it continues for some hours at a distance from home, until the alarm be past away; and then it returns, by paths that to all quadrupeds but itself are utterly impassable. Its usual way of moving is by bounds; these it takes from one tree to another, at forty feet distance; and if at any time it is obliged to descend, it runs up the side of

the next tree with amazing facility. It has an extremely sharp piercing note, which most usually expresses pain ; it has another more like the purring of a cat, which it employs when pleased ; at least it appeared so in that from whence I have taken a part of this description.

In Lapland, and the extensive forests to the north, the squirrels are observed to change their habitation, and to remove in vast numbers from one country to another. In these migrations they are generally seen by thousands, travelling directly forward ; while neither rocks, forests, nor even the broadest waters, can stop their progress. What I am going to relate appears so extraordinary, that were it not attested by numbers of the most credible historians, among whom are Klein and Linnæus, it might be rejected, with that scorn with which we treat imposture or credulity : however, nothing can be more true than that when these animals, in their progress, meet with broad rivers, or extensive lakes, which abound in Lapland, they take a very extraordinary method of crossing them. Upon approaching the banks, and perceiving the breadth of the water, they return, as if by common consent, into the neighbouring forest, each in quest of a piece of bark, which answers all the purposes of boats for wafting them over. When the whole company are fitted in this manner, they boldly commit their little fleet to the waves ; every squirrel sitting on its own piece of bark, and fanning the air with its tail, to drive the vessel to its desired port. In this orderly manner they set forward, and often cross lakes several miles broad. But it too often happens that the poor mariners are not aware of the dangers of their navigation ; for although at the edge of the water it is generally calm, in the midst it is always more turbulent. There the slightest additional gust of wind oversets the little sailor and his vessel together. The whole navy, that but a few minutes before rode proudly and securely along, is now overturned, and a shipwreck of two or three thousand sail ensues. This, which is so unfortunate for the little animal, is generally the most lucky accident in the world for the Laplander on the shore ; who gathers up the dead bodies as they are thrown in by the waves, eats the flesh, and sells the skins for about a shilling the dozen.¹

The squirrel is easily tamed, and it is then a very familiar

¹ Œuvres de Regnard.

animal. It loves to lie warm, and will often creep into a man's pocket, or his bosom. It is usually kept in a box and fed with hazel nuts. Some find amusement in observing with what ease it bites the nut open, and eats the kernel. In short, it is a pleasing pretty little domestic; and its tricks and habitudes may serve to entertain a mind unequal to stronger operations.

THE FLYING SQUIRREL.*

MR RAY was justly of opinion, that the flying squirrel might more properly be said to be of the rat kind, because its fur is shorter than in other squirrels, and its colours also more nearly approach the former. However, as mankind have been content to class it among the squirrels, it is scarcely worth making a new distinction in its favour. This little animal, which is frequently brought over to England, is less than a common squirrel, and bigger than a field mouse. Its skin is very soft, and elegantly adorned with a dark fur in some places, and light gray in others. It has large prominent black and very sparkling eyes, small ears, and very sharp teeth, with which it gnaws any thing quickly. When it does not leap, its tail, which is pretty enough, lies close to its back; but when it takes its spring, the tail is moved backwards and forwards from side to side. It is said to partake somewhat of the nature of the squirrel, of the rat, and of the dormouse; but that in which it is distinguished from all other animals, is its peculiar conformation for taking those leaps that almost look like flying. It is indeed amazing

* There are eight species of flying squirrels, but there is only a trifling difference between them. The European squirrel differs from the American species principally in having its tail full of hair, and rounded at the end, and in the colour of its body, the upper part of which is a fine grey, and the lower white. Its whole length is about nine inches, of which the tail occupies five. The *European flying squirrel* is found in the woods of Lapland and Norway, where it feeds principally on the tender branches of the beech and pine trees. In its habits of life it differs very little from the preceding species. It always sleeps during the day-time, and seldom appears abroad in bad weather. It is active through the whole winter, being frequently caught during that season, in the traps that are laid for the grey squirrels. The females, when they have young ones, never leave their nest in pursuit of food, without previously wrapping these carefully up in the moss. They pay to them the utmost attention, brooding anxiously over them, and tenderly sheltering their bodies, by their flying membrane, from the cold.

to see it at one bound dart above a hundred yards from one tree to another. They are assisted in this spring by a very peculiar formation of the skin that extends from the fore-feet to the hinder ; so that when the animal stretches its fore-legs forward and its hind-legs backward, this skin is spread out between them, somewhat like that between the legs of a bat. The surface of the body being thus increased, the little animal keeps buoyant in the air until the force of its first impulsion is expired, and then it descends. This skin, when the creature is at rest, or walking, continues wrinkled up on its sides ; but when its limbs are extended, it forms a kind of web between them of above an inch broad on either side, and gives the whole body the appearance of a skin floating in the air. In this manner the flying squirrel changes place, not like a bird by repeated strokes of its wings, but rather like a paper kite, supported by the expansion of the surface of its body ; but with this difference, however, that, being naturally heavier than the air, instead of mounting it descends ; and that jump, which upon the ground would not be above forty yards, when from a higher tree to a lower may be above a hundred.

This little animal is more common in America than in Europe, but not very common to be seen in either. It is usually found, like the squirrel, on the tops of trees ; but, though better fitted for leaping, it is of a more torpid disposition, and is seldom seen to exert its powers ; so that it is often seized by the pole-cat and the martin. It is easily tamed, but apt to break away whenever it finds an opportunity. It does not seem fond of nuts or almonds, like other squirrels, but is chiefly pleased with the sprouts of the birch, and the cones of the pine. It is fed in its tame state with bread and fruits ; it generally sleeps by day, and is always most active by night. Some naturalists gravely caution us not to let it get among our corn fields, where, they tell us, it will do a great deal of damage, by cropping the corn as soon as it begins to ear !¹

¹ He may easily be made tame : but he is apt to do a great deal of damage in the corn fields, because he will crop the corn as soon as it begins to ear.

THE MARMOUT.*

FROM the description of the squirrel and its varieties, we proceed to a different tribe of animals, no way indeed resembling the squirrel, but still something like the rabbit and the hare. We are to keep these two animals still in view as the centre of our comparison ; as objects to which many other may bear some similitude, though they but little approach each other. Among the hare kind is the Marmout, which naturalists have placed either among the hare kind or the rat kind, as it suited their respective systems. In fact, it bears no great resemblance to either ; but of the two it approaches nearer the hare, as well in the make of its head as in its size, in its bushy tail, and particularly in its chewing the cud, which alone is sufficient to determine our choice in giving it its present situation. How it ever came to be degraded into the rat or mouse I cannot conceive, for it no way resembles them in size, being nearly as big as a hare ; or in its disposition, since no animal is more tractable, nor more easily tamed.

The marmout is, as was said, almost as big as a hare, but it is more corpulent than a cat, and has shorter legs. Its head pretty nearly resembles that of a hare, except that its ears are much shorter. It is clothed all over with very long hair, and a shorter fur below. These are of different colours, black and gray. The length of the hair gives the body the appearance of greater corpulence than it really has, and at the same time shortens the feet, so that its belly seems touching the ground. Its tail is tufted and well furnished with hair, and it is carried in a straight direction with its body. It has five claws behind, and only four before. These it uses as the squirrel does, to carry its food to its mouth ; and it usually sits upon its hinder parts to feed, in the manner of that little animal.

The marmout is chiefly a native of the Alps ; and when taken young is tamed more easily than any other wild animal, and almost as perfectly as any of those that are domestic. It is readily taught to dance, to wield a cudgel, and to obey the voice of its

* There are eleven species of this animal, the most curious of which is the Lapland marmout or leming, for which see an account in a succeeding page under the head *leming*.

1 Buffon, from whence the remainder of this description is taken. N. B. He takes it from Gesner, vol. xvii.

master. Like the cat, it has an antipathy to the dog ; and when it becomes familiar to the family, and is sure of being supported by its master, it attacks and bites even the largest mastiff. From its squat muscular make, it has great strength, joined to great agility. It has four large cutting teeth, like all those of the hare kind, but it uses them to much more advantage, since in this animal they are very formidable weapons of defence. However, it is in general a very inoffensive animal ; and, except its enmity to dogs, seems to live in friendship with every creature, unless when provoked. If not prevented, it is very apt to gnaw the furniture of a house, and even to make holes through wooden partitions ; from whence, perhaps, it has been compared to the rat. As its legs are very short, and made somewhat like those of a bear, it is often seen sitting up, and even walking on its hind-legs in like manner ; but with the fore-paws, as was said, it uses to feed itself in the manner of a squirrel. Like all of the hare kind, it runs much swifter up hill than down ; it climbs trees with great ease, and runs up the clefts of rocks or the contiguous walls of houses with great facility. It is ludicrously said that the Savoyards, who are the only chimney-sweepers of Paris, have learned this art from the marmout, which is bred in the same country.

These animals eat indiscriminately of whatever is presented to them ; flesh, bread, fruits, herbs, roots, pulse, and insects. But they are particularly fond of milk, and butter. Although less inclined to petty thefts than the cat, yet they always try to steal into the dairy, where they lap up the milk like a cat, purring all the while like that animal, as an expression of their being pleased. As to the rest, milk is the only liquor they like. They seldom drink water and refuse wine. When pleased or caressed, they often yelp like puppies ; but when irritated or frightened, they have a piercing note that hurts the ear. They are very cleanly animals, and like the cat retire upon necessary occasions ; but their bodies have a disagreeable scent, particularly in the heat of summer. This tinctures their flesh, which being very fat and firm, would be very good, were not this flavour always found to predominate.

We have hitherto been describing affections in this animal which it has in common with many others ; but we now come to one which particularly distinguishes it from all others of this kind, and indeed, from every other quadruped, except the bat and

the dormouse ; this is its sleeping during the winter. The marmout, though a native of the highest mountains, and where the snow is never wholly melted, nevertheless seems to feel the influence of the cold more than any other, and in a manner has all its faculties chilled up in winter. This extraordinary suspension of life and motion for more than half the year, deserves our wonder, and excites our attention to consider the manner of such temporary death, and the subsequent revival. But first to describe, before we attempt to discuss.

The marmout, usually at the end of September, or the beginning of October, prepares to fit up its habitation for the winter, from which it is never seen to issue till about the beginning or the middle of April. This animal's little retreat is made with great precaution, and fitted up with art. It is a hole on the side of a mountain, extremely deep, with a spacious apartment at the bottom, which is rather longer than it is broad. In this several marmouts can reside at the same time, without crowding each other, or injuring the air they breathe. The feet and claws of this animal seem made for digging ; and, in fact, they burrow into the ground with amazing facility, scraping up the earth like a rabbit, and throwing back what they have thus loosened behind them. But the form of their hole, is still more wonderful ; it resembles the letter Y ; the two branches being two openings, which conduct into one channel, which terminates in their general apartment that lies at the bottom. As the hole is made on the declivity of a mountain, there is no part of it on a level but the apartment at the end. One of the branches or openings issues out sloping downwards ; and this serves as a kind of sink or drain to the whole family, where they make their excrements, and where the moisture of the place is drawn away. The other branch, on the contrary, slopes upwards, and this serves as their door, upon which to go out and in. The apartment at the end is very warmly stuccoed round with moss and hay, of both which they make an ample provision during the summer. As this is a work of great labour, so it is undertaken in common ; some cut the finest grass, others gather it, and others take their turns to drag it into their hole. Upon this occasion, as we are told, one of them lies on its back, permits the hay to be heaped upon its belly, keeps its paws upright to make greater room ; and in this manner, lying still upon its back, it is dragged by the tail, hay and all, to their

common retreat. This also some give as a reason for the hair being generally worn away on their backs, as is usually the case ; however, a better reason for this may be assigned, from their continually rooting up holes, and passing through narrow openings. But be this as it will, certain it is that they all live together, and work in common to make their habitation as snug and convenient as possible. In it they pass three parts of their lives ; into it they retire when the storm is high ; in it they continue while it rains ; there they remain when apprehensive of danger, and never stir out except in fine weather, never going far from home even then. Whenever they venture abroad, one is placed as a sentinel, sitting upon a lofty rock, while the rest amuse themselves in playing along green fields, or are employed in cutting the grass and making hay for their winter's convenience. Their trusty sentinel, when an enemy, a man, a dog, or a bird of prey approaches, apprises its companions with a whistle, upon which they all make home, the sentinel himself bringing up the rear.

But it must not be supposed that this hay is designed for provision ; on the contrary, it is always found in as great plenty in their holes at the end as at the beginning of winter ; it is only sought for the convenience of their lodging, and the advantages of their young. As to provision, they seem kindly apprised by Nature that during the winter they shall not want any ; so that they make no preparations for food, though so diligently employed in fitting up their abode. As soon as they perceive the first approaches of the winter, during which their vital motions are to continue in some measure suspended, they labour very diligently to close up the two entrances of their habitation, which they effect with such solidity, that it is easier to dig up the earth any where else than where they have closed it. At that time they are very fat, and some of them are found to weigh above twenty pounds ; they continue so for even three months more ; but by degrees their flesh begins to waste, and they are usually very lean by the end of winter. When their retreat is opened, the whole family is then discovered, each rolled into a ball, and covered up under hay. In this state they seem entirely lifeless ; they may be taken away, and even killed without their testifying any great pain ; and those who find them in this manner, carry them home, in order to breed up the young and eat the old ones.

A gradual and gentle warmth revives them ; but they would die if too suddenly brought near the fire, or if their juices were too quickly liquefied.

Strictly speaking, says Mr Buffon, these animals cannot be said to sleep during the winter ; it may be called rather a *torpor*, a stagnation of all the faculties.¹ This torpor is produced by the congelation of their blood, which is naturally much colder than that of all other quadrupeds. The usual heat of man and other animals is about thirty degrees above congelation ; the heat of these is not above ten degrees. Their internal heat is seldom greater than that of the temperature of the air. This has been often tried by plunging the ball of the thermometer into the body of a living dormouse, and it never rose beyond its usual pitch in air, and sometimes it sunk above a degree. It is not surprising, therefore, that these animals, whose blood is so cold naturally, should become torpid, when the external cold is too powerful for the small quantity of heat in their bodies yet remaining ; and this always happens when the thermometer is not more than ten degrees above congelation. This coldness Mr Buffon has experienced in the blood of the bat, the dormouse, and the hedge-hog, and with great justice he extends the analogy to the marmout, which, like the rest, is seen to sleep all the winter. This torpid state continues as long as the cause which produces it continues ; and it is very probable that it might be lengthened out beyond its usual term, by artificially prolonging the cold : if, for instance, the animal were rolled up in wool, and placed in a cold cellar, nearly approaching to, but not quite so cold as an ice-house, for that would kill them outright, it would remain perhaps a whole year in its state of insensibility. However this be, if the heat of the air be above ten degrees, these animals are seen to revive ; and if it be continued in that degree of temperature, they do not become torpid, but eat and sleep at proper intervals, like all other quadrupeds whatever.

From the above account we may form some conception of the state in which these animals continue during the winter. As in some disorders, where the circulation is extremely languid, the appetite is diminished in proportion, so in these the blood scarcely moving, or only moving, in the greater vessels, they want no nourishment to repair what is worn away by its motions. They

¹ Buffon, vol. xvi. Loirs.

are seen, indeed by slow degrees to become leaner in proportion to the slow attrition of their fluids ; but this is not perceptible, except at the end of some months. Man is often known to gather nourishment from the ambient air ; and these also may, in some measure, be supplied in the same manner ; and having sufficient motion in their fluids to keep them from putrefaction, and just sufficient nourishment to supply the waste of their languid circulation, they continue rather feebly alive than sleeping.

These animals produce but once a-year, and usually bring forth but three or four at a time. They grow very fast, and the extent of their lives is not above nine or ten years ; so that the species is neither numerous nor very much diffused. They are chiefly found in the Alps, where they seem to prefer the brow of the highest mountains to the lowest ranges, and the sunny side to that in the shade. The inhabitants of the country where they chiefly reside, when they observe the hole, generally stay till winter before they think proper to open it ; for if they begin too soon, the animal wakes, and as it has a surprising faculty of digging, makes its hole deeper in proportion as they follow. Such as kill it for food, use every art to improve the flesh, which is said to have a wild taste, and to cause vomitings.¹ They, therefore, take away the fat, which is in great abundance, and salt the remainder, drying it somewhat in the manner of bacon. Still, however, it is said to be very indifferent eating. This animal is found in Poland under the denomination of the *Bobak*, entirely resembling that of the Alps, except that the latter has a toe more upon its fore-foot than the former. It is found also in Siberia under the name of the *Jevraska*, being rather smaller than either of the other two. Lastly, it is found in Canada by the appellation of the *Monax*, differing only from the rest in having a bluish snout and a longer tail.

THE AGOUTI.²

FROM the marmout, which differs from the hare so much in

¹ Dictionnaire Raisonnee, vol. iii. p. 29.

² This animal, together with the Paca, Apera, Guinea Pig, Capibara, and a few other species, are now arranged under the general appellation of Cavy. They are distinguished by having two wedge-shaped front teeth in each jaw, and eight grinders on each side in both jaws ; they have from four to six toes on the fore-feet, and from three to five on the hinder : the

the length of its fur, we go to the Agouti, another species equally differing in the shortness of its hair. These bear some rude resemblance to the hare and the rabbit in their form and manner of living, but sufficiently differing to require a particular description. The first of these, and that the largest, as was hinted above, is called the *agouti*. This animal is found in great abundance in the southern parts of America, and has by some been called the *rabbit* of that continent. But, though in many respects it resembles the rabbit, yet still in many more it differs, and is, without all doubt, an animal peculiar to the new world only. The agouti is about the size of a rabbit, and has a head very much resembling it, except that the ears are very short in comparison. It resembles the rabbit also in the arched form of its back, in the hind legs being longer than the fore, and in having four great cutting-teeth, two above and two below; but then it differs in the nature of its hair, which is not soft and downy as in the rabbit, but hard and bristly like that of a sucking-pig, and of a reddish brown colour. It differs also in the tail, which is even shorter than the rabbit, and entirely destitute of hair. Lastly, it differs in the number of its toes, having but three on the hinder feet, whereas the rabbit has five. All these distinctions, however, do not countervail against its general form, which resembles that of a rabbit, and most travellers have called it by that name.

As this animal differs in form, it differs still more in habitudes and disposition. As it has the hair of a hog, so also it has its voraciousness.³ It eats indiscriminately of all things; and, when satiated, hides the remainder, like the dog or the fox, for a future occasion. It takes a pleasure in gnawing and spoiling every thing it comes near. When irritated, its hair stands erect along the back, and, like the rabbit, it strikes the ground violently with its hind feet. It does not dig a hole in the ground, but burrows in the hollows of trees. Its ordinary food consists of the roots of the country, potatoes, and yams, and such fruits as fall from the trees in autumn. It uses its fore-paws, like the squirrel, to carry its food to its mouth: and as its hind feet are longer than the tail is very short or none, and they have no collar bones. They are inhabitants of warmer regions, live entirely on vegetable substances, reside under ground or beneath the roots of trees, and move with a slow and kind of leaping pace,

fore, it runs very swiftly upon plain ground or up a hill, but upon a descent it is in danger of falling. Its sight is excellent, and its hearing equals that of any other animal; whenever it is whistled to, it stops to hearken. The flesh of such as are fat and well fed is tolerable food, although it has a peculiar taste, and is a little tough. The French dress it like a sucking-pig, as we learn from Mr Buffon's account; but the English dress it with a pudding in its belly, like a hare. It is hunted by dogs; and whenever it has got into a sugar-ground, where the canes cover the place, it is easily overtaken, for it is embarrassed every step it takes, so that a man may easily come up with it without any other assistance. When in the open country, it usually runs with great swiftness before the dogs, until it gains its retreat, within which it continues to hide, and nothing but filling the hole with smoke can force it out. For this purpose, the hunter burns fagots or straw at the entrance, and conducts the smoke in such a manner that it fills the whole cavity. While this is doing, the poor little animal seems sensible of its danger, and begs for quarter with a most plaintive cry, seldom quitting its hole till the utmost extremity. At last, when half-suffocated, it issues out, and trusts once more to its speed for protection. When still forced by the dogs, and incapable of making good a retreat, it turns upon the hunters, and with its hair bristling like a hog, and standing upon its hind-feet, it defends itself very obstinately. Sometimes it bites the legs of those that attempt to take it, and will take out the piece wherever it fixes its teeth.¹

Its cry when disturbed or provoked, resembles that of a sucking-pig. If taken young, it is easily tamed, continues to play harmlessly about the house, and goes out and returns of its own accord. In a savage state it usually continues in the woods, and the female generally chooses the most obscure parts to bring forth her young. She there prepares a bed of leaves and dry grass, and generally brings forth two at a time. She breeds twice or thrice a-year, and carries her young from one place to another, as convenience requires, in the manner of a cat. She generally lodges them, when three days old, in the hollow of a tree, suckling them but a very short time; for they soon come to perfection, and it should consequently follow that they soon grow old.

1 Ray's Synop.

THE PACA.

THE Paca is also an animal of South America, very much resembling the former, and like it has received the name of the *American rabbit*, but with as little propriety. It is about the size of a hare, or rather larger, and in figure somewhat like a sucking-pig, which it also resembles in its grunting and its manner of eating. It is, however, most like the agouti, although it differs in several particulars. Like the agouti, it is covered rather with coarse hair than a downy fur. But then it is beautifully marked along the sides with small ash-coloured spots, upon an amber-coloured ground ; whereas the agouti is pretty much of one reddish colour. The paca is rather more thick and corpulent than the agouti ; its nose is shorter, and its hind-feet have five toes ; whereas the agouti has but three. As to the rest, this animal bears some distant resemblance to a rabbit, the ears are naked of hair, and somewhat sharp, the upper jaw is somewhat longer than the lower, the teeth, the shape of the head, and the size of it, are like to those of a rabbit. It has a short tale likewise, though not tufted ; and its hinder legs are longer than the fore. It also burrows in the ground like that animal, and from this similitude alone, travellers might have given it the name.

The paca does not make use of its fore-paws, like the squirrel or the agouti, to carry its food to the mouth, but hunts for it on the ground, and roots like a hog. It is generally seen along the banks of rivers, and is only to be found in the moist and warm countries of South America. It is a very fat animal, and in this respect much preferable to the agouti, that is most commonly found lean. It is eaten, skin and all, like a young pig, and is considered as a great delicacy. Like the former little animal, it defends itself to the last extremity, and is very seldom taken alive. It is persecuted not only by man, but by every beast and bird of prey, who all watch its motions, and, if it ventures at any distance from its hole, are sure to seize it. But although the race of these little animals is thus continually destroyed, it finds some refuge in its hole, from the general combination ; and breeds in such numbers, that the diminution is not perceptible.

To these animals may be added others, very similar, both in form and disposition ; each known by its particular name in its

native country, but which travellers have been contented to call rabbits or hares ; of which we have but indistinct notice. The **TAPETI**, or the **BRASILIAN RABBIT**, is in shape like our English ones, but is much less, being said to be not above twice the size of a dormouse. It is reddish on the forehead, and a little whitish under the throat. It is remarkable for having no tail ; but it has long ears, with whiskers, like our rabbits, and black eyes. It does not burrow, like ours ; but lives at large, like the hare.

The **APEREA** is called also by some the **BRASILIAN RABBIT**, being an animal that seems to partake of the nature of a rabbit and a rat. The ears are like those of a rat, being short and round ; but the other parts are like those of a rabbit, except that it has but three toes on the hinder legs, like the agouti.

To these imperfect sketches of animals little known, others less known might be added ; for as nature becomes more diminutive, her operations are less attentively regarded. I shall only, therefore, add one animal more to this class, and that very well known ; I mean the **Guinea-pig** ; which **Brisson** places among those of the rabbit kind ; and as I do not know any other set of animals with which it can be so well compared, I will take leave to follow his example.

THE GUINEA PIG.

THE **Guinea-pig** is a native of the warmer climates ; but has been so long rendered domestic, and so widely diffused, that it is now become common in every part of the world. There are few unacquainted with the figure of this little animal ; in some places it is considered as the principal favourite ; and is often found even to displace the lap-dog. It is less than a rabbit, and its legs are shorter ; they are scarcely seen, except when it moves ; and the neck also is so short, that the heads seems stuck upon the shoulders. The ears are short, thin, and transparent ; the hair is like that of a sucking-pig, from whence it has taken the name ; and it wants even the vestiges of a tail. In other respects, it has some similitude to the rabbit. When it moves, its body lengthens like that animal ; and when it is at rest, it gathers up in the same manner. Its nose is formed with the rabbit lip, except that its nostrils are much farther asunder. Like all other animals in a domestic state, its colours are different ; some

are white, some are red, and others both red and white. It differs from the rabbit in the number of its toes, having four toes on the feet before, and but three on those behind. It strokes its head with the forefeet, like the rabbit; and, like it, sits upon the hind-feet; for which purpose there is a naked callous skin on the back part of the legs and feet.

These animals are, of all others, the most helpless and inoffensive.¹ They are scarcely possessed of courage sufficient to defend themselves against the meanest of all quadrupeds, a mouse. Their only animosity is exerted against each other: for they will often fight very obstinately; and the stronger is often known to destroy the weaker. But against all other aggressors, their only remedy is patience and non-resistance. How, therefore, these animals, in a savage state, could contrive to protect themselves, I have not been able to learn; as they want strength, swiftness, and even the natural instinct so common to almost every other creature.

As to their manner of living among us, they owe their lives entirely to our unceasing protection. They must be constantly attended, shielded from the excessive colds of the winter, and secured against all other domestic animals, which are apt to attack them, from every motive, either of appetite, jealousy, or experience of their pusillanimous nature. Such, indeed, is their stupidity, that they suffer themselves to be devoured by the cats without resistance; and, differing from all other creatures, the female sees her young destroyed without once attempting to protect them. Their usual food is bran, parsley, or cabbage-leaves; but there is scarce a vegetable cultivated in our gardens that they will not gladly devour. The carrot-top is a peculiar dainty, as also salad; and those who would preserve their healths, would do right to vary their food; for if they be continued on a kind too succulent or too dry, the effects are quickly perceived upon their constitution. When fed upon recent vegetables, they seldom drink. But it often happens that, conducted by nature, they seek drier food, when the former disagrees with them. They then gnaw clothes, paper, or whatever of this kind they meet with; and on these occasions they are seen to drink like most other animals, which they do by lapping. They are chiefly

¹ This history is partly taken from the *Aménités Academiques*, vol. iv. p. 202.

fond of new milk ; but, in case of necessity, are content with water.

They move pretty much in the manner of rabbits, though not near so swiftly ; and when confined in a room, seldom cross the floor, but generally keep along the wall. The male usually drives the female on before him, for they never move abreast together, but constantly the one seems to tread in the footsteps of the preceding. They chiefly seek for the darkest recesses, and the most intricate retreats ; where, if hay be spread as a bed for them, they continue to sleep together, and seldom venture out but when they suppose all interruption removed. On these occasions they act as rabbits ; they swiftly move forward from their bed, stop at the entrance, listen, look round, and, if they perceive the slightest approach of danger, they run back with precipitation. In very cold weather, however, they are more active, and run about in order to keep themselves warm.

They are a very cleanly animal, and very different from that whose name they go by. If the young ones happen to fall into the dirt, or be any other way discomposed, the female takes such an aversion to them, that she never permits them to visit her more. Indeed, her whole employment, as well as that of the male, seems to consist in smoothing their skins, in disposing their hair, and improving its gloss. The male and female take this office by turns ; and when they have thus brushed up each other, they then bestow all their concern on their young, taking particular care to make their hair lie smooth, and biting them if they appear refractory. As they are so solicitous for elegance themselves, the place where they are kept must be regularly cleaned, and a new bed of hay provided for them at least every week. Being natives of a warm climate, they are naturally chilly in ours ; cleanliness, therefore, assists warmth and expels moisture. They may be thus reared, without the aid of any artificial heat ; but, in general, there is no keeping them from the fire in winter, if they be once permitted to approach it.

When they go to sleep, they lie flat on their bellies, pretty much in their usual posture ; except that they love to have their fore-feet higher than their hinder. For this purpose they turn themselves several times round before they lie down, to find the most convenient situation. They sleep like the hare, with their eyes half open ; and continue extremely watchful, if they

suspect danger. The male and female are never seen both asleep at the same time ; but while he enjoys his repose, she remains upon the watch silently continuing to guard him, and her head turned towards the place where he lies. When she supposes that he has had his turn, she then awakes him with a kind of murmuring noise, goes to him, forces him from his bed, and lies down in his place. He then performs the same good turn for her ; and continues watchful till she also has done sleeping.

These animals are exceedingly salacious, and generally are capable of coupling at six weeks old. The female never goes with young above five weeks ; and usually bring forth from three to five at a time ; and this not without pain. But what is very extraordinary, the female admits the male the very day she has brought forth, and becomes again pregnant ; so that their multiplication is astonishing. She suckles her young but about twelve or fifteen days ; and during that time does not seem to know her own ; for if the young of any other be brought, though much older, she never drives them away, but suffers them even to drain her, to the disadvantage of her own immediate offspring. They are produced with the eyes open, like all others of the hare kind ; and in about twelve hours, equal even to the dam in agility. Although the dam has but two teats, yet she abundantly supplies them with milk ; and they are also capable of feeding upon vegetables, almost from the very beginning. If the young ones are permitted to continue together, the stronger, as in all other societies, soon begin to govern the weak. Their contentions are often long and obstinate ; and their jealousies very apparent. Their disputes are usually for the warmest place, or the most agreeable food. If one of them happens to be more fortunate in this respect than the rest, the strongest generally comes to dispossess it of its advantageous situation. Their manner of fighting, though terrible to them, is ridiculous enough to a spectator. One of them seizes the hair on the nape of the other's neck with its fore-teeth, and attempts to tear it away ; the other to retaliate, turns its hinder parts to the enemy, and kicks up behind like a horse, and with its hinder claws scratches the sides of its adversary ; so that sometimes they cover each other with blood. When they contend in this manner, they gnash their teeth pretty loudly, and this is often a denunciation of mutual resentment.

These; though so formidable to each other, yet are the most timorous creatures upon earth, with respect to the rest of animated nature: a falling leaf disturbs them, and every animal overcomes them. From hence they are difficultly tamed; and will suffer none to approach them, except the person by whom they are fed. Their manner of eating is something like that of the rabbit; and, like it, they appear also to chew the cud. Although they seldom drink, they make water every minute. They grunt somewhat like a young pig; and have a more piercing note to express pain. In a word, they do no injury; but then, except the pleasure they afford the spectator, they are of very little benefit to mankind. Some, indeed, dress and eat them; but their flesh is indifferent food, and by no means a reward for the trouble of rearing them. This, perhaps, might be improved, by keeping them in a proper warren, and not suffering them to become domestic: however, the advantages that would result from this would be few, and the trouble great; so that it is likely they will continue a useless, inoffensive dependent, rather propagated to satisfy caprice than to supply necessity.

BOOK VI.

ANIMALS

OF

THE RAT, HEDGEHOG, ETC. KINDS.

CHAP. I.

THE RAT KIND.¹

WERE it necessary to distinguish animals of the rat kind from all others, we might describe them as having two large cutting teeth, like the hare kind, in each jaw; as covered with hair; and as not ruminating. These distinctions might serve to guide us, had we not too near an acquaintance with this noxious race to be mistaken in their kind. Their numbers, their minuteness, their vicinity, their vast multiplication, all sufficiently contribute to press them upon our observation, and remind us of their existence. Indeed, if we look through the different ranks of animals, from the largest to the smallest, from the great elephant to the diminutive mouse, we shall find that we suffer greater injuries from the contemptible meanness of the one, than the formidable invasions of the other. Against the elephant, the rhinoceros, or the lion, we can oppose united strength, and by art make up the deficiencies of natural power: these we have driven into their native solitudes, and obliged to continue at a distance, in the most inconvenient regions and unhealthful climates. But it is otherwise with the little teasing race I am now describing: no force can be exerted against their unresisting timidity; no arts can diminish their amazing propagation:

¹ These have the upper front teeth wedge-shaped, three grinders on each side in each jaw, though sometimes only two, and have perfect collar bones. In Turton's *Linne* forty-six species are described, besides varieties.

millions may be at once destroyed, and yet the breach be repaired in the space of a very few weeks; and in proportion as nature has denied them force, it has supplied the defect by their fecundity.

THE GREAT RAT.

THE animal best known at present, and in every respect the most mischievous, is the great rat; which, though but a new comer into this country, has taken too secure a possession to be ever removed. This hateful and rapacious creature, though sometimes called the *rat of Norway*, is utterly unknown in all the northern countries, and, by the best accounts I can learn, comes originally from the Levant. Its first arrival, as I am assured, was upon the coasts of Ireland, in those ships that traded in provisions to Gibraltar; and perhaps we owe to a single pair of these animals, the numerous progeny that now infests the whole extent of the British empire.

This animal, which is called by Mr Buffon the *surmulot*,* is

* The Surmulot or brown rat came from the southern regions of Asia, and its instinct has established it more completely among us than we could have ever done by our intelligence. Vain efforts, indeed, are daily made to naturalize in our climates species that might be useful, and which seem to require much less for that purpose than this animal, whose wants are numerous. Notwithstanding this, it has been introduced and multiplied among us, in spite of every natural difficulty with which it had to encounter, and every effort on our part to expel it. Its multiplication at present is so great that it is impossible effectually to oppose its encroachments and ravages. It finds sustenance and shelter to such an extent in the habitations of man, that he may be considered more as its protector than its enemy.

The surmulots have found in the burrows which they have dug beneath our roofs that degree of temperature necessary to their preservation. In our cultivated fields, in our granaries, in fact in all the provision which the foresight of man has collected, they have found an aliment suitable to their life, and favourable to their reproduction. Under other circumstances they must have perished here from the effect of our winters, as they have neither the faculty of lethargizing from the cold, nor the instinct of hoarding up provision. They have profited by the fear with which we have inspired their natural adversaries; and their own natural distrust has preserved them against our attacks and artifices.

The surmulot is larger than the rat. They are sometimes found above eight or nine inches in length. The tail is about one-eighth of the body. This animal is less heavy and clumsy than the marmot or the beaver, and less light than the dormouse or squirrel. Its motions are prompt and

in length about nine inches; its eyes are large and black; the colour of the head, and the whole upper part of the body, is of a light brown, mixed with a tawny and ash colour. The end of the nose, the throat and belly, are of a dirty white, inclining to gray; the feet and legs are almost bare, and of a dirty pale flesh colour; the tail is as long as the body, covered with minute dusky scales mixed with a few hairs, and adds to the general deformity of its detestable figure. It is chiefly in the colour that this animal differs from the *black rat*, or the *common rat*, as it was once called; but now common no longer. This new invader, in a very few years after its arrival, found means to de-

lively, and it climbs and swims with agility. It lives underground, as we have said, in deep dens which it digs with a most astonishing facility. Its perseverance in labour produces effects apparently far surpassing the extent of its powers. It penetrates everywhere. It pierces walls and displaces pavements; and, as the surmulots generally unite in great numbers, when they enter a habitation, they even put the foundation of it in considerable danger. They eat animal and vegetable substances indifferently; grains, roots, and flesh; and though portions of such provisions are constantly found at the bottom of their burrows, yet they lay up no store, at least when they inhabit our dwellings. Buffon says that the old males remain in the country during the winter, and fill their burrows with acorns, &c., which would lead us to suppose that their instinctive propensities varied according to circumstances. But this would be a phenomenon so extraordinary, as to require a very complete and distinct authentication. They make use of their fore teeth in eating, and drink much, lapping with their tongues. They bring forth many times in the year, and generally from eight to twelve at a birth. When they are annoyed in their establishments by men or animals, they remove, and sometimes emigrate to a considerable distance. The habitation they then choose for their retreat is in considerable jeopardy. If they are very numerous, it is likely to be overturned. Towards the middle of the sixteenth century, they were observed for the first time in the neighbourhood of Paris, and M. F. Cuvier assures us that in some of the departments of France they are yet unknown. Pallas tells us that they arrived at Astracan in the autumn of 1727, in such numbers, and in so short a time, that nothing could be done to oppose them. They came from the western desert, and transversed the waves of the Volga, which unquestionably must have swallowed up a part of their horde. They have not advanced any further to the North, and are not to be found in Siberia.

The general colour of this animal is a darkish-gray fawn above, and a pale-gray below. The tail is scaly, *i. e.* covered with small parallelograms of epidermis ranged in circles around it, and underneath the extremity of each lamina of epidermis grow some small gray hairs. The hairs which cover the limbs and the head are short. The mustachios are black, and the soles of the feet, which are naked, are flesh-coloured, as are also the ears and extremity of the muzzle.

stroy almost the whole species, and to possess itself of their retreats.

But it was not against the black rat alone that its rapacity was directed ; all other animals of inferior strength shared the same misfortunes. The contest with the black rat was of short continuance. As it was unable to contend, and had no holes to fly to for retreat, but where its voracious enemy could pursue, the whole race was soon extinguished. The frog also was an animal equally incapable of combat or defence. It had been designedly introduced into the kingdom of Ireland some years before the Norway rat ; and it was seen to multiply amazingly. The inhabitants were pleased with the propagation of a harmless animal, that served to rid their fields of insects ; and even the prejudices of the people were in its favour, as they supposed that the frog contributed to render their waters more wholesome. But the Norway rat soon put a stop to their increase ; as these animals were of an amphibious nature, they pursued the frog to its lakes, and took it even in its own natural element. I am, therefore, assured, that the frog is once more almost extinct in that kingdom ; and that the Norway rat, having no more enemies left there to destroy, is grown less numerous also.

We are not likely, therefore, to gain by the destruction of our old domestics, since they are replaced by such mischievous successors. The Norway rat has the same disposition to injure us, with much greater power of mischief. It burrows in the banks of rivers, ponds, and ditches ; and is every year known to do incredible damage to those mounds that are raised to conduct streams, or to prevent rivers from overflowing. In these holes, which it forms pretty near the edge of the water, it chiefly resides during the summer, where it lives upon small animals, fish, and corn. At the approach of winter, it comes nearer the farm-houses, burrows in their corn, eats much, and damages still more than it consumes. But nothing that can be eaten seems to escape its voracity. It destroys rabbits, poultry, and all kinds of game ; and, like the pole-cat, kills much more than it can carry away. It swims with great ease, dives with great celerity, and easily thins the fishpond. In short, scarcely any of the feebler animals escape its rapacity, except the mouse, which shelters itself in its little hole, where the Norway rat is too big to follow.

These animals frequently produce from ten to fifteen at a

time ;¹ and usually bring forth three times a-year. This great increase would quickly be found to overrun the whole country, and render our assiduity to destroy them fruitless, were it not, happily for us, that they eat and destroy each other. The same insatiable appetite that impels them to indiscriminate carnage, also incites the strongest to devour the weakest, even of their own kind. The large male rat generally keeps in a hole by itself, and is as dreaded by its own species, as the most formidable enemy. In this manner the number of these vermin is kept within due bounds ; and when their increase becomes injurious to us, it is repressed by their own rapacity.

But beside their own enmities among each other, all the stronger carnivorous quadrupeds have natural antipathies against them. The dog, though he detests their flesh, yet openly declares his alacrity to pursue them ; and attacks them with great animosity. Such as are trained up to killing these vermin, despatch them often with a single squeeze : but those dogs that show any hesitation, are sure to come off but indifferently ; for the rat always takes the advantage of a moment's delay, and, instead of waiting for the attack, becomes the aggressor, seizing its pursuer by the lip, and inflicting a very painful and dangerous wound. From the inflammation, and other angry symptoms that attend this animal's bite, some have been led to think that it was in some measure venomous ; but it is likely that the difficulty of the wound's healing, arises merely from its being deep, and lacerated by the teeth, and is rather a consequence of the figure of the instruments that inflict it, than any venom they may be supposed to possess.

The cat is another formidable enemy of this kind ; and yet the generality of our cats neither care to attack it, nor to feed upon it when killed. The cat is a more prudent hunter than the dog, and will not be at the pains to take or combat with an enemy that is not likely to repay her time and danger. Some cats, however, will pursue and take the rat ; though often not without an obstinate resistance. If hungry, the cat will sometimes eat the head ; but, in general, she is content merely with her victory.

A foe much more dangerous to these vermin is the weasel. This animal pursues them with avidity, and being pretty nearly

¹ Buffon, vol. xvii. p. 2.

of their own size, follows them into their holes, where a desperate combat ensues. The strength of each is pretty near equal; but the arms are very different. The rat, furnished with four long tusks at the extremity of its jaw, rather snaps than bites; but the weasel, where it once fastens, holds, and continuing also to suck the blood at the same time, weakens its antagonist, and always obtains the victory. Mankind have contrived several other methods of destroying these noxious intruders; ferrets, traps, and particularly poison; but of all other poisons, I am told that the *nux vomica*, ground and mixed with meal, is the most certain, as it is the least dangerous.

To this species I will subjoin as a variety, the BLACK RAT,* mentioned above, greatly resembling the former in figure, but

* Nothing indicates any knowledge of this animal among the ancients, and the modern authors who have spoken clearly on the subject, go no farther back than the sixteenth century. Gessner is perhaps the first naturalist who has described it. Had this animal lived formerly as it does at present, among us, and at our expense, it is not probable that all mention of it would have been omitted, especially as we find notices of other animals of a similar kind, less remarkable and less destructive, such as the Mouse, Dormouse, &c. Some naturalists think with Linnæus and Pallas, that we have received it from America, and others believe that it is a present of our own to that country, made after we had ourselves received it from the eastern regions. To this question it is perhaps impossible to reply, and with the lights which we possess on the subject, conjecture is but a frivolous amusement. It is certain that the Rat is to be found in all the warm and temperate climates of the globe, that it is wonderfully common in Persia, and multiplied to a prodigious extent in the western islands, where it is not obliged by winter to seek a refuge in the habitations of man, but where the fields during the entire year present it with abundance of nutriment. In all this part of America, accordingly, it has become a perfect scourge, from its ravages and devastations. In fact, the Rat consumes an immense quantity of provision, and destroys or damages still more than it consumes, particularly in the fields, as it cuts up from the roots plants of which it eats but a portion.

With us its favourite abode is in barns or granaries, under straw roofs, or in deserted houses. Sometimes it will burrow in the earth like the Surmulot, or Brown Rat, when it can get no other habitation. Though this last-mentioned species does not mix with the Common or black Rat now under consideration, and even may sometimes destroy it, yet the natural antipathy commonly supposed to exist between them is an error. The Surmulots do not necessarily exclude the Rats from their vicinity, nay, the two species often live under the same shelter, and in contiguous burrows. This occurs when the place of their establishment affords food in abundance, and excludes the necessity of mutual warfare for subsistence. In the contrary case, we find that the Surmulots not only destroy the Rats, but that the latter, as is well known, will devour one another.

very distinct in nature, as appears from their mutual antipathy. This animal was formerly as mischievous as it was common; but at present it is almost utterly extirpated by the great rat, one malady often expelling another. It is become so scarce, that I do not remember ever to have seen one. It is said to be possessed of all the voracious and unnatural appetites of the former: though, as it is less, they may probably be less noxious. Its length is about seven inches; and the tail is near eight inches long. The colour of the body is of a deep iron gray, bordering upon black, except the belly, which is of a dirty cinereous hue. They have propagated in America in great numbers, being originally introduced from Europe; and as they seem to keep their ground wherever they get footing, they are now become the most noxious animals in that part of the world.

To this also we may subjoin the BLACK WATER-RAT, about the same size with the latter, with a larger head, a blunter nose, less eyes, and shorter ears, and the tip of its tail a little white. It was supposed by Ray to be web-footed; but this has been found to be a mistake, its toes pretty much resembling those of its kind. It never frequents houses; but is usually found on the banks of rivers, ditches, and ponds, where it burrows and breeds. It feeds on fish, frogs, and insects; and in some countries it is eaten on fasting days.¹

THE MOUSE.

An animal equally mischievous, and equally well known with the former, is the mouse. Timid, cautious, and active, all its dispositions are similar to those of the rat, except with fewer

¹ Dr Shaw, in his general zoology, informs us, that a gentleman travelling through Mecklenburg about thirty years ago, was witness to the following curious circumstance in the post-house at New Stargard. After dinner the landlord placed on the floor a large dish of soup, and gave a loud whistle. Immediately then came into the room a mastiff, a fine Angora cat, an old raven, and a remarkably large rat with a bell about its neck. The four animals went to the dish, and, without disturbing each other, fed together; after which the dog, cat, and rat, lay before the fire, while the raven hopped about the room. The landlord, after accounting for the familiarity which existed among the animals, informed his guest that the rat was the most useful of the four; for the noise he made had completely freed the house from the rats and mice with which it was before infested.

powers of doing mischief.¹ Fearful by nature, but familiar from necessity, it attends upon mankind, comes an unbidden guest to his most delicate entertainments. Fear and necessity seem to regulate all its motions ; it never leaves its hole but to seek provision, and seldom ventures above a few paces from home. Different from the rat, it does not go from one house to another, unless it be forced ; and as it is more easily satisfied, it does much less mischief.

Almost all animals are tamed more difficultly in proportion to the cowardice of their natures. The truly bold and courageous easily become familiar, but those that are always fearful are ever suspicious. The mouse being the most feeble, and consequently the most timid of all quadrupeds, except the Guinea-pig, is never rendered thoroughly familiar ; and, even though fed in a cage, retains its natural apprehensions. In fact, it is to these alone that it owes its security.² No animal has more enemies, and few so incapable of resistance. The owl, the cat, the snake, the hawk, the weasel, the rat itself, destroy this species by millions, and it only subsists by its amazing fecundity.

The mouse brings forth at all seasons, and several times in a year. Its usual number is from six to ten. These in less than a fortnight are strong enough to run about and shift for themselves. They are chiefly found in farmers' yards and among their corn, but are seldom in those ricks that are much infested with rats, they generally choose the south-west side of the rick from whence most rain is expected ; and from thence they often, on an evening, venture forth to drink the little drops either of rain or dew that hang at the extremities of the straw.³ Aristotle gives us an idea of their prodigious fecundity, by assuring us, that having put a mouse with young into a vessel of corn, in some time after he found a hundred and twenty mice, all sprung from one original. The early growth of this animal implies also the short duration of its life, which seldom lasts above two or three years. This species is very much diffused, being found in almost all parts of the ancient continent, and having been exported to the new.⁴ They are

1 Buffon, vol. xv. p. 145.

2 *E volueribus hirundines sunt indociles, e terrestribus mures.* PLIN.

3 Buffon, vol. xv. p. 147.

4 Lillie's Husbandry, vol. ii. p. 391,

animals that, while they fear human society, closely attend it ; and, although enemies to man, are never found but near those places where he has fixed his habitation. Numberless ways have been found for destroying them ; and Gesner has minutely described the variety of traps by which they are taken. Our Society for the Encouragement of Arts and Manufactures proposed a reward for the most ingenious contrivance for that purpose ; and I observed almost every candidate passing off descriptions as inventions of his own. I thought it was cruel to detect the plagiarism or frustrate the humble ambition of those who would be thought the inventors of a mouse-trap.

To this species, merely to avoid teasing the reader with a minute description of animals very inconsiderable and very nearly alike, I will add that of the LONG-TAILED FIELD-MOUSE, which is larger than the former, of a colour very nearly resembling the Norway rat, and chiefly found in fields and gardens. They are extremely voracious, and hurtful in gardens and young nurseries, where they are killed in great numbers. However, their fecundity quickly repairs the destruction.

Nearly resembling the former, but larger, (for it is six inches long,) is the SHORT-TAILED FIELD-MOUSE ; which, as its name implies, has the tail much shorter than the former, it being not above an inch and a half long, and ending in a small tuft. Its colour is more inclining to that of the domestic mouse, the upper part being blackish, and the under of an ash colour. This, as well as the former, are remarkable for laying up provision against winter ; and Mr Buffon assures us they sometimes have a store of above a bushel at a time.*

* *The Economic Campagnol*.—The length of this animal is about four inches, exclusive of the tail, which measures one inch. The limbs are strong ; the ears short, naked, and almost hidden beneath the fur of the head.—The general colour is tawny, somewhat whiter beneath than on the back.

Economic Campagnols are found in various parts of Siberia and Kamtschatka, where they make their burrows, with the utmost skill, immediately below the surface of a soft turfy soil. They form a chamber of a flattish arched form, about a foot in diameter, to which they sometimes add twenty or thirty small passages or entrances. Near the chamber they frequently construct other caverns, in which they deposit their stores or plants, which they gather in summer and bring home ; and even at times they bring them out of their cells to give them a more thorough drying in the sun. They associate in pairs ; and except during the summer, when the male leads a

We may add also the SHREW-MOUSE to this species of minute animals, being about the size of the domestic mouse, but differing greatly from it in the form of its nose, which is very long and slender. The teeth also are of a very singular form, and twenty-eight in number; whereas the common number in the rat kind is usually not above sixteen. The two upper fore teeth are very sharp, and on each side of them there is a kind of wing or beard, like that of an arrow, scarcely visible but on a close inspection. The other teeth are placed close together, being very small, and seeming scarcely separated; so that with respect to this part of its formation, the animal has some resemblance to the viper. However, it is a very harmless little creature, doing scarcely any injury. On the contrary, as it lives chiefly in the fields, and feeds more upon insects than corn, it

solitary life in the woods, the male and female commonly sleep in the same nest.

The migrations of these quadrupeds have been noticed both by Dr Grieve and Mr Pennant; but neither of them have attempted to explain the cause. "In the spring," says the former writer, "they assemble in amazing numbers, and proceed in a direct course westward, swimming with the utmost intrepidity over rivers, lakes, and even arms of the sea. Many are drowned, and many are destroyed by water-fowl, or rapacious fish. Those that escape, on emerging from the water, rest awhile to bask, dry their fur, and refresh themselves. The Kamtschadales, who have a kind of superstitious veneration for these little animals, whenever they find any of them on the banks of the rivers, weak and exhausted, render them every possible assistance. As soon as they have crossed the river Pensclinska, at the head of the gulf of the same name, they turn in a south-westerly direction; and about the middle of July, generally reach the rivers Ochetska and Judoma, a distance of about a thousand miles! The flocks are also so numerous, that travellers have waited about two hours for them to pass. The retirement of these animals is considered by the Kamtschadales as a serious misfortune; but their return occasions the utmost joy and festivity, a successful chase and fishery being always considered as its certain consequence."

Kerr informs us, that the Kamtschadales never destroy the hoards of these rats. Sometimes, indeed, they take away part of their store; but, in return for this, they invariably leave some caviare, or other food, to support them in its stead.

The manner in which the economic campagnols on their foraging excursions cross the rivers of Iceland, is thus described by Mr Olaffen.—"The party, consisting of from six to ten, select a flat piece of dried cow-dung, on which they place the berries they have collected in a heap on the middle. Then, with their united force, drawing it to the water's edge, they launch it, and embark; placing themselves round the heap, with their heads joined over it, and their backs to the water, their tails pendent in the stream serving the purpose of rudders."

may be considered rather as a friend than an enemy. It has a strong, disagreeable smell, so that the cat, when it is killed, will refuse to eat it. It is said to bring four or five young at a time.

THE DORMOUSE.*

THESE animals may be distinguished into three kinds; the GREATER DORMOUSE, which Mr Buffon calls the LOIR; the

* In the system of nature this forms a distinct genus, of which there are four species, the Fat, the Wood, the Garden, and the Common Dormouse.

The *Wood-Mouse* of Shaw, *Field-Rat* of Pennant, or *Mulot* of Buffon, (*Mus Sylvaticus*, Lin.) is in general under five inches long, and the tail is rather less, but it varies considerably in dimensions. Its colour is very dark, yellowish-brown, whitish on the under part; the tail is dark-brown above, and dirty-white underneath; but as it varies in size, and is an inhabitant of a large portion of the earth, so it also varies in colour. Its head is both thicker and larger, comparatively with the body, than that of the Rat; the eyes are very large and prominent; the ears are large; and the animal stands higher than the rat. The *Mulot* or *Wood-Mouse* is found throughout Europe, and, though rarely, in Russia. It is a very destructive little animal, as its habits induce it, like the Squirrel, to lay up a large store of winter provision, consisting of nuts, acorns, corn, &c. These animals multiply occasionally to an extraordinary degree, and become great pests by their predatory and wasteful habits.

The *Harvest-Mouse*, (*Mus Messorius*, White) is probably the smallest of British quadrupeds, the body not exceeding two inches and a quarter in length, and the tail two inches; and the weight is said to be about one-sixth of an ounce. Either this species is exclusively British, or it has hitherto escaped the industrious researches of the continental naturalists, for it is doubtful whether it can be identified with the *Mus Pendulinus* of Hermann.

Mr White, in his history of Selbourn, first made this species known to the public.

"These mice (he says) are much smaller and more slender than the *mus domesticus medius* of Ray, and have more of the squirrel or dormouse colour; their belly is white; a straight line along their sides divides the shades of their back and belly. They never enter into houses; are carried into ricks and barns with the sheaves; abound in harvest, and build their nest amidst the straws of corn above ground, and sometimes in thistles. They breed as many as eight at a litter, in a little brown nest, composed of blades of grass or wheat. The nest is most artificially plaited, and composed of the blades of wheat, perfectly round, and about the size of a cricket-ball, with the aperture so ingeniously closed, that there is no discovering to what part it belongs. It is so compact and well fitted, that it will roll across a table without being discomposed, though it contained eight little mice, which are naked and blind. As the nest is perfectly full, how could the dam," asks Mr White, "come at her litter respectively, so as to administer a teat to each? Perhaps she opens different places for that purpose, adjusting them again when the business is over; but she could not possibly be contained herself

MIDDLE, which he calls the LEROT ; the LESS, which he denominates the MUSCARDIN. They differ from each other in size, the largest being equal to a rat, the least being no bigger than a mouse. They all differ from the rat in having the tail tufted with hair, in the manner of a squirrel, except that the squirrel's tail is flat, resembling a fan ; and theirs round, resembling a brush. The lerot differs from the loir by having two black spots near the eyes ; the muscardin differs from both in the whitish colour of its hair on the back. They all three agree in having black sparkling eyes ; and the whiskers partly white and partly black. They agree in their being stupified, like the marmout, during the winter, and in their hoarding up provisions to serve them in case of a temporary revival.

They inhabit the woods or very thick hedges, forming their nests in the hollow of some tree, or near the bottom of a close shrub, humbly content with continuing at the bottom, and never aspiring to sport among the branches. Towards the approach of the cold season, they form a little magazine of nuts, beans, or acorns ; and having laid in their hoard, shut themselves up with it for the winter. As soon as they feel the first advances of the cold, they prepare to lessen its effect by rolling themselves up in a ball, and thus exposing the smallest surface to the weather. But it often happens that the warmth of a sunny day, or an accidental change from cold to heat, thaws their nearly stagnant fluids, and they revive. On such occasions they have their provisions laid in, and they have not far to seek for their support. In this manner they continue usually asleep, but sometimes waking, for about five months in the year, seldom venturing from their retreats, and, consequently, but rarely seen. Their nests are lined with moss, grass, and dead leaves ; they usually bring forth three or four young at a time, and that but once a year, in the spring.

THE MUSK RAT.

Of these animals of the rat kind, but with a musky smell, in the ball with her young, which, moreover, would be daily increasing in bulk."

Mr White informs us, that though they constructed nests for breeding above ground, and are found most abundantly in corn-ricks in Hampshire they nevertheless burrow in winter, and pass the severe season underground.

there are also three distinctions, as of the former ; the ONDATRA, the DESMAN, and the PILORI. The ondatra is a native of Canada, the desman of Lapland, and the pilori of the West India islands. The ondatra differs from all others of its kind, in having the tail flattened and carried edge-ways. The desman has a long extended snout, like the shrew-mouse ; and the pilori a short tail, as thick at one end as the other. They all resemble each other in being fond of the water, but particularly in that musky odour from whence they have taken their name.

Of these the ONDATRA is the most remarkable, and has been the most minutely described.¹ This animal is about the size of a small rabbit, but has the hair, the colour, and the tail of a rat, except that it is flattened on the sides, as mentioned above. But it is still more extraordinary upon other accounts, and different from all other animals whatever. It is so formed that it can contract and enlarge its body at pleasure. It has a muscle like that of horses, by which they move their hides, lying immediately under the skin, and that furnished with such a power of contraction, together with such an elasticity in the false ribs, that this animal can creep into a hole where others, seemingly much less, cannot follow. The female is remarkable also for two distinct apertures, one for urine, the other for propagation. The male is equally observable for a peculiarity of conformation ; the musky smell is much stronger at one particular season of the year than any other ; and the marks of the sex seem to appear and disappear in the same manner.

The ondatra in some measure resembles the beaver in its nature and disposition. They both live in society during winter ; they both form houses of two feet and a half wide, in which they reside several families together. In these they do not assemble to sleep as the marmout, but purely to shelter themselves from the rigour of the season. However, they do not lay up magazines of provision like the beaver ; they only form a kind of covert-way to and round their dwelling, from whence they issue to procure water and roots, upon which they subsist. During winter their houses are covered under a depth of eight or ten feet of snow ; so that they must lead out a cold, gloomy, and necessitous life, during its continuance. During summer they sepa-

1 Buffon, vol xx. p. 4.

rate two by two, and feed upon the variety of roots and vegetables that the season offers. They then become extremely fat, and are much sought after, as well for their flesh as their skins, which are very valuable. They then also acquire a very strong scent of musk, so pleasing to an European, but which the savages of Canada cannot abide. What we admire as a perfume, they consider as a most abominable stench, and call one of their rivers, on the banks of which this animal is seen to burrow in numbers, by the name of the *stinking river*, as well as the rat itself, which is denominated by them the *stinkard*. This is a strange diversity among mankind; and, perhaps, may be ascribed to the different kinds of food among different nations. Such as chiefly feed upon rancid oils, and putrid flesh, will often mistake the nature of scents; and, having been long used to ill smells, will, by habit, consider them as perfumes. Be this as it will, although these nations of northern savages consider the musk rat as intolerably fœtid, they nevertheless regard it as very good eating; and, indeed, in this they imitate the epicures of Europe very exactly, whose taste seldom relishes a dish till the nose gives the strongest marks of disapprobation. As to the rest, this animal a good deal resembles the beaver in its habits and disposition; but, as its instincts are less powerful, and its economy less exact, I will reserve for the description of that animal a part of what may be applicable to this.

THE CRICETUS.

THE Cricetus, or German Rat, which Mr Buffon calls the *hamster*, greatly resembles the water-rat in its size, small eyes, and the shortness of its tail. It differs in colour, being rather browner, like the Norway rat, with the belly and legs of a dirty yellow. But the marks by which it may be distinguished from all others are two pouches, like those of a baboon, on each side of its jaw, under the skin, into which it can cram a large quantity of provision. These bags are oblong, and of the size, when filled, of a large walnut. They open into the mouth, and fall back along the neck to the shoulder. Into these the animal can thrust the surplus of those fruits or grains it gathers in the fields, such as wheat, peas, or acorns. When the immediate calls of hunger are satisfied, it then falls to filling these; and thus loaded with

two great bunches on each side of the jaw, it returns home to its hole to deposit the spoil as a store for the winter. The size, the fecundity, and the voraciousness of this animal, render it one of the greatest pests in the countries where it is found, and every method is made use of to destroy it.*

* Among animals of this kind, which are furnished with pouches on each side the mouth, the most remarkable is the Canada rat. Its size is that of the Norway rat, though of a more lengthened form. Its colour is a pale grayish-brown, paler beneath. The pouches attached to the cheeks are of a very large size, shaped somewhat like an egg, reach to the ground, and have the appearance of a pair of inflated bladders.

The *Anomalous Hamster*, found in the Isle of Trinity, is about the size of the common rat, but the nose is more pointed; the ears are naked, round, and of moderate size: the pouches are formed by a duplicature of the common tegument, like the pouch of the opossum, and are of considerable size. The body is covered with fine lance-shaped spines, stronger on the back than elsewhere, intermixed with hair. This species differs perhaps generically from the other Hamsters, with which, indeed, it seems to have no other relationship than by the cheek-pouches.

The genus *Gerboa* approximates considerably to the rats properly so called, by a great number of characters of internal organization, but is sufficiently distinguished by the shortness of the anterior limbs, and the length of the hinder extremities, or to speak more correctly, of the hinder metatarsi, and by the tail, which is covered with long hairs at its extremities.

As to external conformation, the Gerboas exhibit some relations with the kangaroos. The form of the body is the same in general. The hinder limbs are likewise five or six times stronger than the fore. In both genera the tail is very long; the ears elongated, and pointed, and the eyes very large and round. But though the Kangaroos have so many traits of external conformation similar to the Gerboas, they are infinitely removed from them in most important points, such as the organs of generation, ventral pouch, &c.

The Gerboas have the same teeth as the rats, that is, they have two incisors in each jaw; and the lower, instead of being flat and cut scissors-like, as the upper, on the contrary, are conic and pointed. The molars are generally six in number, three on each side. They are slightly sloped. There is sometimes an additional one in the upper jaw. In the Gerboas the cheek-bones are very prominent, which gives a singular and flattened form to the front part of the head. The muzzle is short, large, and obtuse. A considerable number of stiff hairs extend on each side, and form long mustachios. The nose is naked, cartilaginous, and in one species rather complicated. The ears are long and pointed; the eyes large, and placed altogether on the sides of the head.

The body is a little elongated, larger behind than before, and well covered with soft and silken hairs. The fore-feet are very short and feeble. They have four or five toes according to the species. The thumb or interior toe, where it exists, is very short, rounded at its extremity, and provided with an obtuse nail. The other toes are long and armed with crooked nails. The hind-feet are as disproportioned as those of the kangaroos, being four or

But although this animal is very noxious with respect to man, yet, considered with regard to those instincts which conduce to its own support and convenience, it deserves our admiration.¹ Its hole offers a very curious object for contemplation, and shows a degree of skill superior to the rest of the rat kind. It consists of a variety of apartments, fitted up for the different occasions of the little inhabitant. It is generally made on an inclining ground, and always has two entrances, one perpendicular, and the other oblique; though, if there be more than one in a family, there are as many perpendicular holes as there are individuals below. The perpendicular hole is usually that through which they go in and out: the oblique serves to give a thorough air to keep the retreat clean, and in case one hole is stopped, to give an exit at this. Within about a foot of the perpendicular hole, the animal makes two more, where are deposited the family's provisions. These are much more spacious than the former, and are large in proportion to the quantity of the store. Beside these, there is still another apartment warmly lined with grass and straw, where the female brings forth her young; all these communicate with each other, and all together

five times longer than the fore-feet. They are terminated by five or six toes, according to the species, which are armed with short, but large and obtuse claws.

Ancient and modern naturalists have both been mistaken respecting the walk of the Gerboa. They have all imagined that these quadrupeds walked on their hind feet only, never employing the fore-feet for that purpose. From this error the genus was named *dipus*, two legged.

It usually walks on its four feet; but when frightened from any cause, it endeavours to escape by means of prodigious leaps, which it executes with equal force and activity. When these animals are about to leap, they raise their body upon the extremity of their hind toes, and support themselves upon their tail. Their fore feet are so closely attached to their breast, that they are scarcely visible. Having taken their spring, they leap, and fall upon their four feet; then they elevate themselves again with so much celerity, that it almost appears that they are constantly in an erect posture.

The genus Gerboa is now composed of several distinct species, one of which is extremely abundant in Barbary, in Higher and Lower Egypt, and Syria, and again in the more northern climates, situated between the Tanais and the Volga. The others occupy an immense space in Siberia and the north part of Russia, from Syria to the Eastern Ocean, and as far as the northern parts of Hindostan. A late one, recently described by M. de Blainville, has been published, though it would seem erroneously, as belonging to New Holland.

1 Buffon, vol. xxvi. p. 159.

take up a space of ten or twelve feet in diameter. These animals furnish their store-houses with dry corn, well cleaned; they also lay in corn in the ear, and beans and peas in the pod. These, when occasion requires, they afterwards separate, carrying out the pods and empty ears by their oblique passage. They usually begin to lay in at the latter end of August; and, as each magazine is filled, they carefully cover up the mouth with earth, and that so neatly that it is no easy matter to discover where the earth has been removed. The only means of finding out their retreats are, therefore, to observe the oblique entrance, which generally has a small quantity of earth before it; and this, though often several yards from their perpendicular retreat, leads those who are skilled in the search to make the discovery. Many German peasants are known to make a livelihood by finding out and bringing off their hoards, which, in a fruitful season, often furnish two bushels of good grain in each apartment.

Like most others of the rat kind, they produce twice or thrice a year, and bring five or six at a time. Some years they appear in alarming numbers, at other times they are not so plentiful. The moist seasons assist their propagation; and it often happens on such years that their devastations produce a famine all over the country. Happily, however, for mankind, these, like the rest of their kind, destroy each other; and of two that Mr Buffon kept in a cage, male and female, the latter killed and devoured the former. As to the rest, their fur is considered as very valuable; the natives are invited by rewards to destroy them; and the weasel kind seconds the wishes of government with great success. Although they are usually found brown on the back and white on the belly, yet many of them are observed to be gray; which may probably arise from the difference of age.

THE LEMING.

HAVING considered various kinds of these noxious little animals that elude the indignation of mankind, and subsist by their number, not their strength, we come to a species more bold, more dangerous, and more numerous than any of the former. The leming, which is a native of Scandinavia, is often seen to pour down in myriads from the northern mountains, and, like a

pestilence, destroy all the productions of the earth. It is described as being larger than a dormouse, with a bushy tail, though shorter. It is covered with thin hair of various colours. The extremity of the upper part of the head is black, as are likewise the neck and shoulders, but the rest of the body is reddish, intermixed with small black spots of various figures, as far as the tail, which is not above half an inch long. The eyes are little and black, the ears round and inclining towards the back, the legs before are short, and those behind longer, which gives it a great degree of swiftness. But what it is much more remarkable for than its figure, are, its amazing fecundity and extraordinary migrations.

In wet seasons, all of the rat kind are known to propagate more than in dry; but this species in particular is so assisted in multiplying by the moisture of the weather, that the inhabitants of Lapland sincerely believe that they drop from the clouds, and that the same magazines that furnish hail and snow pour down the leming also upon them. In fact, after long rain, these animals set forward from their native mountains, and several millions in a troop deluge the whole plain with their numbers.¹ They move, for the most part, in a square, marching forward by night, and lying still by day. Thus, like an animated torrent, they are often seen more than a mile broad covering the ground, and that so thick that the hindmost touches its leader. It is in vain that the poor inhabitant resists or attempts to stop their progress, they still keep moving forward, and though thousands are destroyed, myriads are seen to succeed, and make their destruction impracticable. They generally move in lines, which are about three feet from each other, and exactly parallel. Their march is always directed from the north-west to the south-east, and regularly conducted from the beginning. Wherever their motions are turned, nothing can stop them; they go directly forward, impelled by some strange power; and, from the time they first set out, they never once think of retreating. If a lake or a river happens to interrupt their progress, they all together take the water and swim over it; a fire, a deep well, or a torrent does not turn them out of their straight lined direction; they boldly plunge into the flames, or leap down the well, and

¹ Phil. Trans. vol. ii. p. 872.

are sometimes seen climbing up on the other side. If they are interrupted by a boat across a river while they are swimming, they never attempt to swim round it, but mount directly up its sides; and the boatmen, who know how vain resistance in such a case would be, calmly suffer the living torrent to pass over, which it does without further damage. If they meet with a stack of hay or corn that interrupts their passage, instead of going over it, they gnaw their way through; if they are stopped by a house in their course, if they cannot get through it, they continue there till they die. It is happy, however, for mankind, that they eat nothing that is prepared for human subsistence; they never enter a house to destroy the provisions, but are contented with eating every root and vegetable that they meet. If they happen to pass through a meadow, they destroy it in a very short time, and give it an appearance of being burned up and strewed with ashes. If they are interrupted in their course, and a man should imprudently venture to attack one of them, the little animal is no way intimidated by the disparity of strength, but furiously flies up at its opponent, and barking somewhat like a puppy, wherever it fastens does not easily quit the hold. If at last the leader be forced out of its line, which it defends as long as it can, and separated from the rest of its kind, it sets up a plaintive cry, different from that of anger, and, as some pretend to say, gives itself a voluntary death, by hanging itself on the fork of a tree.

An enemy so numerous and destructive would quickly render the countries where they appear utterly uninhabitable, did it not fortunately happen, that the same rapacity that animates them to destroy the labours of mankind, at last impels them to destroy and devour each other.¹ After committing incredible devastations, they are at last seen to separate into two armies, opposed with deadly hatred, along the coast of the larger lakes and rivers. The Laplanders, who observe them thus drawn up to fight, instead of considering their mutual animosities as a happy riddance of the most dreadful pest, form ominous prognostics from the manner of their arrangement. They consider their combats as a presage of war, and expect an invasion from the Russians or the Swedes, as the sides next those kingdoms happen to conquer.

¹ Dictionnaire Raisonné, vol. ii. p. 619.

The two divisions, however, continue their engagements and animosity until one party overcomes the other. From that time they utterly disappear, nor is it well known what becomes of either the conquerors or the conquered. Some suppose that they rush headlong into the sea; others, that they kill themselves, as some are found hanging on the forked branches of a tree; and others still, that they are destroyed by the young spring herbage. But the most probable opinion is, that, having devoured the vegetable productions of the country, and having nothing more to subsist on, they then fall to devouring each other; and, having habituated themselves to that kind of food, continue it. However this be, they are often found dead by thousands, and their carcasses have been known to infect the air for several miles round, so as to produce very malignant disorders. They seem also to infect the plants they have gnawed, for the cattle often die that afterwards feed in the places where they passed.

As to the rest, the male is larger and more beautifully spotted than the female. They are extremely prolific; and, what is extraordinary, their breeding does not hinder their march; for some of them have been observed to carry one young one in their mouth, and another on their back. They are greatly preyed upon by the ermine, and, as we are told, even by the rein-deer. The Swedes and Norwegians, who live by husbandry, consider an invasion from these vermin as a terrible visitation; but it is very different with respect to the Laplanders, who lead a vagrant life, and who, like the leminges themselves, if their provisions be destroyed in one part of the country, can easily retire to another. These are never so happy as when an army of leminges come down amongst them; for then they feast upon their flesh; which, though horrid food, and which, though even dogs and cats are known to detest, these little savages esteem very good eating, and devour greedily. They are glad of their arrival also upon another account, for they always expect a great plenty of game the year following, among those fields which the leminges have destroyed.

THE MOLE.

To these minute animals of the rat kind, a great part of whose lives is passed in holes under ground, I will subjoin one little

animal more, no way resembling the rat, except that its whole life is spent there. As we have seen some quadrupeds formed to crop the surface of the fields, and others to live upon the tops of trees, so the mole is formed to live wholly under the earth, as if nature meant that no place should be left wholly untenanted. Were we from our own sensations to pronounce upon the life of a quadruped that was never to appear above ground, but always condemned to hunt for its prey underneath, obliged, whenever it removed from one place to another, to bore its way through a resisting body, we should be apt to assert that such an existence must be the most frightful and solitary in nature. However, in the present animal, though we find it condemned to all those seeming inconveniences, we shall discover no signs of wretchedness or distress. No quadruped is fatter, none has a more sleek or glossy skin ; and, though denied many advantages that most animals enjoy, it is more liberally possessed of others, which they have in a more scanty proportion.

This animal, so well known in England, is, however, utterly a stranger in other places, and particularly in Ireland. For such, therefore, as have never seen it, a short description will be necessary. And, in the first place, though somewhat of a size between the rat and the mouse, it no way resembles either, being an animal entirely of a singular kind, and perfectly unlike any other quadruped whatever. It is bigger than a mouse, with a coat of fine, short, glossy, black hair. Its nose is long and pointed, resembling that of a hog, but much longer. Its eyes are so small, that it is scarcely possible to discern them. Instead of ears, it has only holes in the place. Its neck is so short that the head seems stuck upon the shoulders. The body is thick and round, terminating by a very small short tail, and its legs also are so very short, that the animal seems to lie flat on its belly. From under its belly, as it rests in this position, the four feet appear just as if they immediately grew out of the body. Thus the animal appears to us at first view as a mass of flesh covered with a fine, shining, black skin, with a little head, and scarcely any legs, eyes, or tail. On a closer inspection, however, two little black points may be discerned, that are its eyes. The ancients, and some of the moderns, were of opinion that the animal was utterly blind ; but Derham, by the help of a microscope, plainly discovered all the parts of the eye that are known in

other animals, as the pupil, the vitreous and crystalline humours. The fore-legs appear very short and strong, and furnished with five claws to each. These are turned outwards and backwards, as the hands of a man when swimming. The hind-legs are longer and weaker than the fore, being only used to assist its motions; whereas the others are continually employed in digging. The teeth are like those of a shrew-mouse, and there are five on both sides of the upper jaw, which stand out; but those behind are divided into points. The tongue is as large as the mouth will hold.

Such is the extraordinary figure and formation of this animal, which, if we compare with its manner of living, we shall find a manifest attention in nature to adapt the one to the other.¹ As it is allotted a subterraneous abode, the seeming defects of its formation vanish, or rather are turned to its advantage. The breadth, strength, and shortness of the fore-feet, which are inclined outwards, answer the purposes of digging, serving to throw back the earth with greater ease, and to pursue the worms and insects which are its prey: had they been longer, the falling in of the earth would have prevented the quick repetition of its strokes in working; or have obliged it to make a larger hole in order to give room for their exertion. The form of the body is not less admirably contrived for its way of life. The fore-part is thick, and very muscular, giving great strength to the action of the fore-feet, enabling it to dig its way with amazing force and rapidity either to pursue its prey, or elude the search of the most active enemy. By its power of boring the earth, it quickly gets below the surface; and I have seen it, when let loose in the midst of a field, like the ghost on a theatre, instantly sink into the earth; and the most active labourer, with a spade, in vain attempted to pursue.

The smallness of its eyes, which induced the ancients to think it was blind, is, to this animal, a peculiar advantage. A small degree of vision is sufficient for a creature that is ever destined to live in darkness. A more extensive sight would only have served to show the horrors of its prison, while nature had denied it the means of an escape. Had this organ been larger, it would have been perpetually liable to injuries, by the falling of the earth into it; but nature, to prevent that inconvenience, has not

¹ British Zoology.

only made them very small, but very closely covered them with hair. Anatomists mention, besides these advantages, another that contributes to their security; namely, a certain muscle, by which the animal can draw back the eye whenever it is necessary or in danger.

As the eye is thus perfectly fitted to the animal's situation, so also are the senses of hearing and smelling. The first gives it notice of the most distant appearance of danger; the other directs it, in the midst of darkness, to its food. The wants of a subterraneous animal can be but few; and these are sufficient to supply them: to eat, and to produce its kind, are the whole employment of such a life; and for both these purposes it is wonderfully adapted by nature.²

Thus admirably is this animal fitted for a life of darkness and solitude; with no appetites but what it can easily indulge, with no enemies but what it can easily evade or conquer. As soon as it has once buried itself in the earth, it seldom stirs out unless forced by violent rains in summer; or, when in pursuit of its prey, it happens to come too near the surface, and thus gets into the open air, which may be considered as its unnatural element. In general, it chooses the looser, softer grounds, beneath which it can travel with greater ease; in such also it generally finds the greatest number of worms and insects, upon which it chiefly preys. It is observed to be most active, and to cast up most earth, immediately before rain; and, in winter, before a thaw: at those times the worms and insects begin to be in motion, and approach the surface, whither this industrious animal pursues them. On the contrary, in very dry weather, the mole seldom or never forms any hillocks; for then it is obliged to penetrate deeper after its prey, which at such seasons retire far into the ground.

As the moles very seldom come above ground, they have but few enemies; and very readily evade the pursuit of animals

2 Testes habet maximos, parastatas amplissimas, novum corpus seminale ab his diversum ac separatum. Penem etiam facile omnium, ni fallor, animalium longissimum, ex quibus colligere est maximam præ reliquis omnibus animalibus voluptatem in coitu, hoc abjectum et vile animalculum percipere, ut habeant quod ipsi invident qui in hoc supremas vitæ suæ delicias collocant: Ray's Synops. Quadrup. p. 239. Huic opinioni assentitur D. Buffon, attamen non mihi apparet magnitudinem partium talem voluptatem augere. Maribus enim salacissimis contrarium obtinet.

stronger and swifter than themselves.¹ Their greatest calamity is an inundation ; which, wherever it happens, they are seen in numbers attempting to save themselves by swimming, and using every effort to reach the higher grounds. The greatest part, however, perish, as well as their young, which remain in the holes behind. Were it not for such accidents, from their great fecundity, they would become extremely troublesome ; and, as it is, in some places, they are considered by the farmer as his greatest pest. They couple towards the approach of spring ; and their young are found about the beginning of May. They generally have four or five at a time ; and it is easy to distinguish among other mole-hills, that in which the female has brought forth her young. These are made with much greater art than the rest, and are usually larger. The female, in order to form this retreat, begins by erecting the earth into a tolerably spacious apartment, which is supported within by partitions, at proper distances, that prevent the roof from falling. All round this she works and beats the earth very firm, so as to make it capable of keeping out the rain, let it be never so violent. As the hillock, in which this apartment is thus formed, is raised above ground, the apartment itself is consequently above the level of the plain, and, therefore, less subject to accidental slight inundations. The place being thus fitted, she then procures grass and dry leaves as a bed for her young. There they lie secure from wet, and she continues to make their retreat equally so from danger ; for all round this hill of her own raising, are holes running into the earth, that part from the middle apartment, like rays from a centre, and extend about fifteen feet in every direction ; these resemble so many walks or chases, into which the animal makes her subterraneous excursions, and supplies her young with such roots or insects as she can provide : but they contribute still more to the general safety ; for as the mole is very quick of hearing, the instant she perceives her little habitation attacked, she takes to her burrow, and unless the earth be dug away by several men at once, she and her young always make good a retreat.

The mole is scarcely found, except in cultivated countries : the varieties are but few. That which is found in Virginia, resembles the common mole, except in colour, which is black,

1 Buffon.

mixed with a deep purple. There are sometimes white moles, seen particularly in Poland, rather larger than the former. As their skin is so very soft and beautiful, it is odd that it has not been turned to any advantage. Agricola tells us, that he saw hats made from it, the finest and the most beautiful that could be imagined.*

* The *Zemni*, *Blind Rat* of Pennant and Shaw, to which Guldenstaedt applied the Greek name, *Spalax*, has been hitherto referred to the mole. This singular animal attains nearly ten inches in length, and its cylindrical body is full two inches in diameter. Its thick head, nearly pyramidal, narrower in front, is terminated by a very hard and strong cartilaginous muzzle. The nostrils are round and narrow; the opening of the mouth is small. The incisive teeth are extremely prominent and strong, those in the lower jaw twice the length of the others; the under lip is shorter than the upper, and does not cover the teeth.

Aristotle has observed that externally there are no traces of eyes: if the skin of the head be taken off, a tendinous expansion may be perceived extending over the orbits, immediately under which is a glandulous body, oblong, a little flattened, toward the middle of which is a black spot representing the globe of the eye, and which appears perfectly well organized, though not half a line in thickness. Nothing in short appears wanting to constitute a perfect eye, but a greater development of parts. Whether the *spalax* be absolutely blind, or whether it receive any perception of light through the medium of the eye as an organ, does not sufficiently appear by what has hitherto been said by its describers. The presence of what may be called the vestige of an organ, seems perfectly consistent with other instances, in which the application of such imperfect organ, is not at all to be traced. On the contrary, it accords with that apparent unwillingness in nature to depart from prescribed laws. The total absence of an accustomed organ is much more anomalous in nature than the complete inutility of an imperfect one. So it seems with the *spalax*, which is not without the vestige of eyes, though their application as organs of sight seems doubtful.

The *spalax* has the organs of hearing in a very perfect state. What is denied on the one hand is prodigally bestowed on the other, and the creature is thereby enabled to preserve its existence. The external ear, indeed, has but a very small outward expansion, but the auditory canal is very large, and the whole organ internally greatly developed.

The neck of this animal is large, short, and muscular, by which the head is capable of considerable strength considered relatively to its size, and the whole animal takes a cylindrical shape; the feet are short, armed with round trenchant nails, rather larger on the hind feet, than on those before.

The whole animal is covered with a short soft fur, the base of which is blackish ash-colour, and the extremity reddish, whence results a general tint of yellowish gray. They are sometimes found spotted with white.

The Greeks, as has been generally assumed, described the mole, *ασταλαξ* as blind, an error which modern zoologists have piqued themselves in detecting. The *ασταλαξ* of the Greeks was, however, doubtless, the animal now under consideration, which was indigenous in their country or around them, whereas the mole was an exotic in Greece. The Romans may bear

CHAP II.

THE HEDGEHOG, OR PRICKLY KIND.

ANIMALS of the Hedgehog kind require but very little accuracy to distinguish them from all others. That hair which serves the generality of quadrupeds for warmth and ornament is partly wanting in these ; while its place is supplied by sharp spines or prickles, that serve for their defence. This general characteristic, therefore, makes a much more obvious distinction than any that can be taken from their teeth or their claws. Nature, by this extraordinary peculiarity, seems to have separated them in a very distinguished manner ; so that, instead of classing the hedgehog among the moles, or the porcupine with the hare, as some have done, it is much more natural and obvious to place them, and others approaching them in this strange peculiarity, in a class by themselves : nor let it be supposed, that while I thus alter their arrangement, and separate them from animals with which they have been formerly combined, that I am destroying any secret affinities that exist in nature. It is natural, indeed, for readers to suppose, when they see two such opposite animals as the hare and the porcupine assembled together in the same group, that there must be some material reason, some secret connection, for thus joining animals so little resembling each other in appearance. But the reasons for this union were very slight, and merely arose from a similitude in the fore-teeth : no likeness in the internal conformation, no similitude in nature, in habitudes, or disposition ; in short, nothing to fasten

the blame of having led us into this error by rendering the word *ασπαλαξ* into *talpa*, and applying that word to the mole of Europe.

The spalax lives gregariously underground. They bore excavations which are not far from the surface, in search of food, but dig a hole lower in the earth for personal retreat and safety. They prefer cultivated grounds and as they subsist principally, if not entirely on roots, they become serious destroyers of the fruits of agriculture. Their movements are precipitate, turning or running sideways, or even backward with facility, when driven and in danger, and they bite with great force and effect. When on the surface, they almost always carry the head raised apparently for the purpose more effectually of hearing what is passing around them ; thus relying on their most perfect faculty for a forewarning of approaching danger, which they have not the means of detecting by sight

the link that combines them, but the similitude in the teeth : this, therefore, may be easily dispensed with ; and, as was said, it will be most proper to class them according to their most striking similitudes.

The hedgehog with an appearance the most formidable, is yet one of the most harmless animals in the world : unable or unwilling to offend, all its precautions are only directed to its own security ; and it is armed with a thousand points to keep off the enemy, but not to invade him. While other creatures trust to their force, their cunning, or their swiftness, this animal, destitute of all, has but one expedient for safety ; and from this alone it often finds protection. As soon as it perceives itself attacked, it withdraws all its vulnerable parts, rolls itself into a ball, and presents nothing but its defensive thorns to the enemy ; thus, while it attempts to injure no other quadruped, they are equally incapable of injuring it : like those knights we have somewhere read of, who were armed in such a manner, that they could neither conquer others, nor be themselves overcome.

This animal is of two kinds ; one with a nose like the snout of a hog ; the other more short and blunt, like that of a dog. That with the muzzle of a dog is the most common, being about six inches in length, from the tip of the nose to the insertion of the tail. The tail is little more than an inch long, and so concealed by the spines, as to be scarcely visible : the head, back, and sides, are covered with prickles : the nose, breast and belly are covered with fine soft hair :¹ the legs are short, of a dusky colour, and almost bare : the toes on each foot are five in number, long and separated : the prickles are about an inch in length, and very sharp pointed ; their lower part is white, the middle black, and the points white : the eyes are small, and placed high in the head : the ears are round, pretty large, and naked : the mouth is small, but well furnished with teeth ; these however it uses in chewing its food, but neither in attacking or defending itself against other animals. Its only reliance, in cases of danger, is on its spines ; the instant it perceives an enemy, it puts itself into a posture of defence, and keeps upon its guard, until it supposes the danger over. On such occasions, it immediately alters its whole

¹ *Præputium propendens.* Linnæi Syst. 75. And of the female he might have said, *resupina copulatur.*

appearance ; from its usual form, somewhat resembling a small animal with a bunch on its back, the animal begins to bend its back, to lay its head upon its breast, to shut its eyes, to roll down the skin of its sides towards the legs, to draw these up, and lastly, to tuck them in on every side, by drawing the skin still closer. In this form, which the hedgehog always puts on when disturbed, it no way resembles an animal, but rather a roundish mass of prickles impervious on every side. The shape of the animal thus rolled up, somewhat resembles a chestnut in the husk : there being, on one side, a kind of flat space, which is that on which the head and legs have been tucked in.

Such is the usual appearance of the hedgehog, upon the approach of any danger. Thus rolled up in a lump, it patiently waits till its enemy passes by, or is fatigued with fruitless attempts to annoy it. The cat, the weasel, the ferret, and the martin, quickly decline the combat ; and the dog himself, generally spends his time in empty menaces, rather than in effectual efforts. Every increase of danger only increases the animal's precautions to keep on its guard ; its assailant vainly attempts to bite, since he thus more frequently feels than inflicts a wound ; he stands enraged and barking, and rolls it along with his paws : still, however, the hedgehog patiently submits to every indignity, but continues secure ; and still more to disgust its enemy with the contest, sheds its urine, the smell of which is alone sufficient to send him away. In this manner, the dog, after barking for some time, leaves the hedgehog where he found him, who perceiving the danger past, at length peeps out from its ball, and if not interrupted, creeps slowly to its retreat.

The hedgehog, like most other wild animals, sleeps by day, and ventures out by night. It generally resides in small thickets, in hedges, or in ditches covered with bushes : there it makes a hole of about six or eight inches deep, and lies well wrapped up in moss, grass, or leaves. Its food is roots, fruits, worms, and insects. It is also said to suck cattle and hurt their udders ; but the smallness of its mouth will serve to clear it from this reproach. It is said also to be very hurtful in gardens and orchards, where it will roll itself in a heap of fruit, and so carry a large quantity away upon its prickles ; but this imputation is as ill grounded as the former, since the spines are so disposed, that no fruit will stick upon them, even if we should try to fix them

rather appears to be a very serviceable animal, in ridding our fields of insects and worms, which are so prejudicial to vegetation.

Mr Buffon, who kept these animals tame about his house, acquits them of the reproach of being mischievous in the garden; but then he accuses them of tricks, of which, from the form and habits of this animal, one would never be led to suspect them. "I have often," says he, "had the female and her young brought me about the beginning of June: they are generally from three to five in number: they are white in the beginning, and only the marks of their spines appear: I was willing to rear some of them, and accordingly put the dam and her young into a tub, with abundant provision beside them; but the old animal, instead of suckling her young, devoured them all one after another. On another occasion, a hedgehog that had made its way into the kitchen discovered a little pot in which there was meat prepared for boiling; the mischievous animal drew out the meat and left its excrements in the stead. I kept males and females in the same apartment, where they lived together but never coupled. I permitted several of them to go about my garden; they did very little damage, and it was scarcely perceivable that they were there: they lived upon the fruits that fell from the trees; they dug the earth into shallow holes; they eat caterpillars, beetles and worms; they were also very fond of flesh, which they devoured boiled or raw."

They couple in spring, and bring forth about the beginning of summer. They sleep during the winter, and what is said of their laying up provisions for that season is consequently false. They at no time eat much, and can remain very long without any food whatsoever. Their blood is cold, like all other animals that sleep during the winter. Their flesh is not good for food; and their skins are converted to scarcely any use except to muzzle calves to keep them from sucking.

THE TANREC AND TENDRAC.

THE Tanrec and Tendrac are two little animals, described by Mr Buffon, of the hedgehog kind: but yet sufficiently different from it to constitute a different species. Like the hedgehog, they are covered with prickles, though mixed in a greater

proportion with hair; but unlike that animal, they do not defend themselves by rolling up in a ball. Their wanting this last property is alone sufficient to distinguish them from an animal in which it makes the most striking peculiarity: as also that in the East Indies, where only they are found, the hedgehog exists separately also; a manifest proof that this animal is not a variety caused by the climate.

The Tanrec is much less than the hedgehog,¹ being about the size of a mole, and covered with prickles, like that animal, except that they are shorter and smaller. The Tendrac is still less than the former, and is defended only with prickles upon the head, the neck, and the shoulders; the rest being covered with a coarse hair resembling a hog's bristles. These little animals, whose legs are very short, move but slowly. They grunt like a hog; and wallow like it in the mire. They love to be near water, and spend more of their time there than upon land. They are chiefly in creeks and harbours of salt water. They multiply in great numbers, make themselves holes in the ground, and sleep for several months. During this torpid state, their hairs (and I should also suppose their prickles) fall; and they are renewed upon their revival. They are usually very fat; and although their flesh be insipid, soft, and stringy, yet the Indians find it to their taste, and consider it as a very great delicacy.

THE PORCUPINE.

THOSE arms which the hedgehog possesses in miniature, the Porcupine has in a more enlarged degree. The short prickles of the hedgehog are, in this animal, converted into shafts. In the one, the spines are about an inch long; in the other, a foot. The porcupine is about two feet long, and fifteen inches high. Like the hedgehog, it appears a mass of misshapen flesh, covered with quills, from ten to fourteen inches long, resembling the barrel of a goose-quill in thickness, but tapering and sharp at both ends. These, whether considered separately or together, afford sufficient subject to detain curiosity. Each quill is thickest in the middle; and inserted into the animal's skin, in the same manner as feathers are found to grow upon birds. It is within-side spongy, like the top of a goose-quill; and of differ-

¹ Buffon, vol. xxv. p. 254.

ent colours, being white and black alternately, from one end to the other. The biggest are often found fifteen inches long, and a quarter of an inch in diameter; extremely sharp, and capable of inflicting a mortal wound. They seem harder than common quills, being difficult to be cut, and solid at the end which is not fixed in the skin. If we examine them in common, as they grow upon the animal, they appear of two kinds, the one such as I have already described; the other, long, flexible, and slender, growing here and there among the former. There is still another sort of quills, that grow near the tail, white and transparent, like writing quills, and that seem to be cut short at the end. All these quills, of whatever kind, incline backwards, like the bristles of a hog; but when the animal is irritated, they rise, and stand upright, as bristles are seen to do.¹

Such is the formation of this quadruped, in those parts in which it differs from most others: as to the rest of its figure, the muzzle bears some resemblance to that of a hare, but black; the legs are very short, and the feet have five toes, both before and behind; and these, as well as the belly, the head, and all other parts of the body, are covered with a sort of short hair, like prickles, there being no part, except the ears and the sole of the foot, that is free from them; the ears are thinly covered with very fine hair; and are in shape like those of mankind: the eyes are small like those of a hog, being only one-third of an inch from one corner to the other. After the skin is taken off, there appear a kind of paps on those parts of the body from whence the large quills proceed; these are about the size of a small pea, each answering to as many holes which appear on the outward surface of the skin, and which are about half an inch deep, like as many hollow pipes, wherein the quills are fixed, as in so many sheaths.

This animal seems to partake very much of the nature of the hedgehog; having this formidable apparatus of arms rather to defend itself, than annoy the enemy. There have been, indeed, many naturalists who supposed that it was capable of dis-

¹ Professor Thunberg, in his second journey to the island *Mature* in the Indian ocean, informs us, that the porcupine has a very curious method of fetching water for its young. The quills in the tail are said to be hollow, and to have a hole at the extremity: these the animal can bend in such a manner, as that they can be filled with water, which is afterwards discharged in the nest among its young.

charging them at its foes, and killing at a great distance off. But this opinion has been entirely discredited of late ; and it is now universally believed that its quills remain firmly fixed in the skin, and are then only shed when the animal moults them, as birds do their feathers. It is true, we are told by Ellis, that a wolf at Hudson's Bay was found dead, with the quills of a porcupine fixed within its mouth ; which might have very well happened, from the voraciousness of the former, and not the resentment of the latter. That rapacious creature, in the rage of appetite, might have attempted to devour the porcupine, quills and all, and very probably paid the forfeit by its life. However this be, of all the porcupines that have been brought into Europe, not one was ever seen to launch their quills ; and yet the irritations they received were sufficient to have provoked their utmost indignation. Of all the porcupines that Dr Shaw observed in Africa, and he saw numbers, not one ever attempted to dart its quills ; their usual manner of defence being, to lie on one side, and when the enemy approaches very near, by suddenly rising, to wound him with the points on the other.¹

It is probable, therefore, that the porcupine is seldom the aggressor ; and when attacked by the bolder animals, it only directs its quills so as to keep always pointing towards the enemy. These are an ample protection ; and, as we are assured by Kolben, at such times even the lion himself will not venture to make an attack. From such, therefore, the porcupine can defend itself ; and chiefly hunts for serpents, and all other reptiles, for subsistence. Travellers universally assure us, that between the serpent and the porcupine there exists an irreconcilable enmity, and that they never meet without a mortal engagement.² The porcupine, on these occasions, is said to roll itself upon the serpent, and thus destroy and devour it. This may be true ; while what we are informed by Monsieur Sarrasin, of the porcupine of Canada chiefly subsisting on vegetables, may be equally so. Those which are brought to this country to be shown, are usually fed on bread, milk, and fruits ; but they will not refuse meat when it is offered them ; and it is probable they pre-

¹ M. de Vaillant in his Travels says, that owing to some pernicious quality in the quills, one of his Hottentots, who had received a wound in his leg from a porcupine, was ill for more than six months.

² Bozmau. Smith. L. P. Vincent Marie, &c.

fer it in a wild state, when it is to be had.' The porcupine is also known to be extremely hurtful to gardens ; and, where it enters, does incredible damage.

The Americans, who hunt this animal, assure us, that the porcupine lives from twelve to fifteen years. During the time of coupling, which is in the month of September, the males become very fierce and dangerous, and often are seen to destroy each other with their teeth. The female goes with young seven months, and brings forth but one at a time ; this she suckles but about a month, and accustoms it betimes to live, like herself, upon vegetables and the bark of trees : she is very fierce in its defence ; but, at other seasons, she is fearful, timid, and harmless. The porcupine never attempts to bite, nor any way to injure its pursuers : if hunted by a dog or a wolf, it instantly climbs up a tree, and continues there until it has wearied out the patience of its adversary ; the wolf knows, by experience, how fruitless it would be to wait ; he therefore leaves the porcupine above, and seeks out for a new adventure. The porcupine does not escape so well from the Indian hunter, who eagerly pursues it, in order to make embroidery of its quills, and to eat its flesh. This, as we are commonly told, is very tolerable eating : however, we may expect wretched provisions when the savages are to be our caterers, for they eat every thing that has life. But they are very ingenious with regard to their embroidery : if I understand the accounts rightly, they dye the quills of various colours, and then splitting them into slips, as we see in the making of a cane chair, they embroider with these their belts, baskets, and several other necessary pieces of furniture.

As to the rest, there are many things related concerning this animal that are fabulous ; but there are still many circumstances more, that yet remain to be known. It were curious to inquire whether this animal moults its quills when wild, for it is never seen to shed them in a domestic state ; whether it sleeps all the winter, as we are told by some naturalists, which we are sure it does not when brought into our country ; and, lastly, whether its quills can be sent off with a shake ; for no less a naturalist than Reaumer was of that opinion.²

1 Buffon.

2 Bewick, in his *General History of Quadrupeds*, says, that upon the smallest irritation it raises its quills, and shakes them with great violence,

All that we can learn of an animal exposed as a show, or even by its dissection, is but merely its conformation; and that makes one of the least interesting parts of its history. We are naturally led, when presented with an extraordinary creature, to expect something extraordinary in its way of living, something uncommon, and corresponding with its figure; but of this animal we know little with any precision, except what it offers in a state of captivity. In such a situation, that which I saw appeared to very little advantage: it was extremely dull and torpid, though very wakeful and extremely voracious, though very capable of sustaining hunger; as averse to any attachment, as to being tamed: it was kept in an iron cage, and the touching one of the bars was sufficient to excite its resentment, for its quills were instantly erected, and the poet was right in his epithet of *fretful*; for it appeared to me the most irascible creature upon earth.

The porcupines of America differ very much from that of the ancient continent, which we have been describing; and, strictly speaking, may be considered as animals of a different species: however, from their being covered with quills, we will only add them as varieties of the former, since we know very little concerning them, except their difference of figure. They are of two kinds; the one called the *couando*; and the other, first named by Mr Buffon, the *urson*; the one a native of the northern parts of America; the other of the south; and both differing from the former, in having long tails, whereas that has a very short one.

The *COUANDO* is much less than the porcupine; its quills are four times shorter, its snout more unlike that of a hare; its tail is long enough to catch by the branches of trees, and hold by them. It may be easily tamed, and it is to be found chiefly in the southern parts of America; yet is not wanting also in the northern.

The *URSON*, which Mr Buffon calls after our countryman directing them to that quarter from whence it is in danger of being attacked, and striking at the object of its resentment at the same time. "We have observed, on an occasion of this sort, at a time when the animal was moulting or casting its quills, that they would fly out to the distance of a few yards with such force as to bend the points of them against the board where they struck; and it is not improbable that a circumstance of this kind may have given rise to an opinion of its power to use them in a more effectual manner."

Hudson, is a native of Hudson's Bay. The make of the body of this animal is not so round as that of the two former, but somewhat resembling the shape of a pig. It is covered with long bristly hair, with a shorter hair underneath; and under this the quills lie concealed very thick; they are white, with a brown point, and bearded, and the longest do not exceed four inches; they stick to the hand when the animal is stroked on the back; and likewise, when the hand is taken away, they stick so fast as to follow it. They make their nest under the roots of great trees, sleep very much, and chiefly feed upon the bark of the juniper. In winter the snow serves them for drink; and in summer they lap water like a dog. They are very common in the country lying to the east of Hudson's Bay; and several of the trading Americans depend on them for food, at some seasons of the year.

CHAP. III.

OF QUADRUPEDS COVERED WITH SCALES OR SHELLS INSTEAD OF HAIR.¹

WHEN we talk of a quadruped, the name seems to imply an animal covered with hair; when we mention a bird, it is natural to conceive a creature covered with feathers; when we hear of a fish, its scales are generally the first part that strikes our imagination. Nature, however, owns none of our distinctions; various in all her operations, she mixes her plans, groups her pictures, and excites our wonder, as well by her general laws as by her deviations. Quadrupeds, which we have considered as making the first general class in animated nature, and, next to man, the most dignified tenants of the earth, are yet, in many respects, related to the classes beneath them, and do not in every respect, preserve their usual distinctions. Their first character, which consists in having four feet, is common to the lizard kind as well as to them. The second prerogative, which is that of bringing forth living young, is found in the cetaceous tribe of

¹ This chapter is chiefly extracted from Mr Buffon, which I mention at once, to save the trouble of repeated quotation.

fishes, and also in insects without number. Their third and last attribute, which seems more general and constant than the former, that of being covered with hair, is yet found in various other animals, and is deficient in quadrupeds themselves. Thus we must be cautious of judging of the nature of animals from one single character, which is always found incomplete ; for it often happens that three or four of the most general characters will not suffice. It must be by a general enumeration of the parts that we can determine precisely of the works of the creation ; and instead of definitions, learn to describe. Had this method been followed, much of the disgust and the intricacy of history might have been avoided, and that time which is now employed in combating error, laid out in the promoting of science.

Were we to judge of nature from definitions only, we should never be induced to suppose that there existed races of viviparous quadrupeds destitute of hair, and furnished with scales and shells in their stead. However, nature, every way various, supplies us with many instances of these extraordinary creatures ; the old world has its quadrupeds covered with scales, and the new with a shell. In both they resemble each other, as well in the strangeness of their appetites, as in their awkward conformation. Like animals but partially made up, and partaking of different natures, they want those instincts which animals, formed but for one element alone, are found to possess. They seem to be a kind of strangers in nature, creatures taken from some other element, and capriciously thrown to find a precarious subsistence upon land.

THE PANGOLIN.

THE Pangolin, which has been usually called the *scaly lizard*, Mr Buffon very judiciously restores to that denomination by which it is known in the countries where it is found. The calling it a lizard, he justly observes, might be apt to produce error, and occasion its being confounded with an animal which it resembles only in its general form and in its being covered with scales. The lizard may be considered as a reptile, produced from an egg ; the pangolin is a quadruped, and brought forth alive, and perfectly formed. The lizard is all over covered with the marks of scales ; the pangolin has scales neither on the throat,

the breast, nor the belly. The scales of the lizard seem stuck upon the body even closer than those of fishes ; the scales of the pangolin are only fixed at one end, and capable of being erected, like those of the porcupine, at the will of the animal. The lizard is a defenceless creature ; the pangolin can roll itself into a ball, like the hedgehog, and present the points of its scales to the enemy, which effectually defend it.

The pangolin, which is a native of the torrid climates of the ancient continent, is, of all other animals, the best protected from external injury by nature. It is about three or four feet long ; or, taking in the tail, from six to eight. Like the lizard, it has a small head, a very long nose, a short thick neck, a long body, legs very short, and a tail extremely long, thick at the insertion, and terminating in a point. It has no teeth, but is armed with five toes on each foot, with long white claws. But what it is chiefly distinguished by, is its scaly covering, which, in some measure, hides all the proportions of its body. These scales defend the animal on all parts, except the under part of the head and neck, under the shoulders, the breast, the belly, and the inner side of the legs ; all which parts are covered with a smooth, soft skin, without hair. Between the shells of this animal, at all the interstices, are seen hairs like bristles, brown at the extremity, and yellow towards the root. The scales of this extraordinary creature are of different sizes and different forms, and stuck upon the body somewhat like the leaves of an artichoke. The largest are found near the tail, which is covered with them like the rest of the body. These are above three inches broad, and about two inches long, thick in the middle and sharp at the edges, and terminated in a roundish point. They are extremely hard, and their substance resembles that of horn. They are convex on the outside, and a little concave on the inner ; one edge sticks in the skin, while the other laps over that immediately behind it. Those that cover the tail, conform to the shape of that part, being of a dusky brown colour, and so hard, when the animal has acquired its full growth, as to turn a musket-ball.

Thus armed, this animal fears nothing from the efforts of all other creatures, except man. The instant it perceives the approach of an enemy, it rolls itself up like the hedgehog, and presents no part but the cutting edges of its scales to the assailant.

Its long tail, which at first view, might be thought easily separable, serves still more to increase the animal's security. This is lapped round the rest of the body, and, being defended with shells even more cutting than any other part, the creature continues in perfect security. Its shells are so large, so thick, and so pointed, that they repel every animal of prey; they make a coat of armour that wounds while it resists, and at once protects and threatens. The most cruel, the most famished quadruped of the forest, the tiger, the panther, and the hyæna, make vain attempts to force it. They tread upon, they roll it about, but all to no purpose; the pangolin remains safe within, while its invader almost always feels the reward of its rashness. The fox often destroys the hedgehog by pressing it with his weight, and thus obliges it to put forth its nose, which he instantly seizes, and soon after the whole body; but the scales of the pangolin effectually support it under any such weight, while nothing that the strongest animals are capable of doing can compel it to surrender. Man alone seems furnished with arms to conquer its obstinacy. The negroes of Africa, when they find it, beat it to death with clubs, and consider its flesh as a very great delicacy.

But although this animal be so formidable in its appearance, there cannot be a more harmless inoffensive creature when unmolested. It is even unqualified by nature to injure larger animals, if it had the disposition, for it has no teeth. It should seem that the bony matter, which goes in other animals to supply the teeth, is exhausted in this in supplying the scales that go to the covering of its body. However this be, its life seems correspondent to its peculiar conformation. Incapable of being carnivorous, since it has no teeth, nor of subsisting on vegetables, which require much chewing, it lives entirely upon insects, for which nature has fitted it in a very extraordinary manner. As it has a long nose, so it may naturally be supposed to have a long tongue; but, to increase its length still more, it is doubled in the mouth, so that when extended it is shot out to above a quarter of a yard beyond the tip of the nose. This tongue is round, extremely red, and covered with an unctuous and slimy liquor, which gives it a shining hue. When the pangolin, therefore, approaches an ant-hill, for these are the insects on which it chiefly feeds, it lies down near it, concealing as much as possible the place of its retreat, and stretching out its long tongue among

the ants, keeps it for some time quite immovable. These little animals, allured by its appearance, and the unctuous substance with which it is smeared, instantly gather upon it in great numbers; and when the pangolin supposes a sufficiency, it quickly withdraws the tongue, and swallows them at once. This peculiar manner of hunting for its prey is repeated, either till it be satisfied, or till the ants, grown more cautious, will be allured to their destruction no longer. It is against these noxious insects, therefore, that its only force or cunning is exerted; and were the negroes but sufficiently sensible of its utility in destroying one of the greatest pests to their country, they would not be so eager to kill it. But it is the nature of savage men to pursue the immediate good, without being solicitous about the more distant benefit they remove. They, therefore, hunt this animal with the utmost avidity for its flesh; and as it is slow, and unable to escape in an open place, they seldom fail of destroying it. However, it chiefly keeps in the most obscure parts of the forest, and digs itself a retreat in the clefts of rocks, where it brings forth its young, so that it is but rarely met with, and continues a solitary species, and an extraordinary instance of the varying of nature.

Of this animal, there is a variety which is called the PHATAGIN, much less than the former, being not above a foot long from the head to the tail, with shells differently formed, with its belly, breast, and throat covered with hair, instead of a smooth skin, as in the former: but that by which it is peculiarly distinguished, is the extent of its tail, which is above twice the length of its body. Both are found in the warm latitudes of the East, as well as in Africa; and, as their numbers are but few, it is to be supposed their fecundity is not great.

THE ARMADILLO, OR TATOU.

HAVING mentioned quadrupeds of the ancient continent covered with scales, we come next to quadrupeds of the new continent covered with shells. It would seem that Nature had reserved all the wonders of her power for these remote and thinly inhabited countries, where the men are savage, and the quadrupeds various. It would seem that she becomes more extraordinary in proportion as she retires from human inspection.

But the real fact is, that wherever mankind are polished, or thickly planted, they soon rid the earth of these odd and half-formed productions, that in some measure encumber the soil. They soon disappear in a cultivated country, and continue to exist only in those remote deserts where they have no enemies but such as they are enabled to oppose.

The armadillo is chiefly an inhabitant of South America; a peaceful, harmless creature, incapable of offending any other quadruped, and furnished with a peculiar covering for its own defence. The pangolin, described above, seems an inactive, helpless being, indebted for safety more to its patience than its power; but the armadillo is still more exposed and helpless. The pangolin is furnished with an armour that wounds while it resists, and that is never attacked with impunity; but the armadillo is obliged to submit to every insult, without any power of repelling its enemy; it is attacked without danger, and is consequently liable to more various persecutions.

This animal being covered, like a tortoise, with a shell, or rather a number of shells, its other proportions are not easily discerned. It appears, at first view, a round misshapen mass, with a long head, and a very large tail sticking out at either end, as if not of a piece with the rest of the body. It is of different sizes, from a foot to three feet long, and covered with a shell divided into several pieces, that lap over each other like the plaits in a coat of armour, or in the tail of a lobster. The difference in the size of this animal, and also the different disposition and number of its plaits, have been considered as constituting so many species, each marked with its own particular name. In all, however, the animal is partially covered with this natural coat of mail; the conformation of which affords one of the most striking curiosities in natural history. This shell, which in every respect resembles a bony substance, covers the head, the neck, the back, the sides, the rump, and the tail to the very point. The only parts to which it does not extend, are the throat, the breast, and the belly, which are covered with a white soft skin, somewhat resembling that of a fowl stripped of its feathers. If these naked parts be observed with attention, they will be found covered with the rudiments of shells, of the same substance with those which cover the back. The skin even in the parts which are softest, seems to have a tendency to ossify;

but a complete ossification takes place only on those parts which have the least friction, and are the most exposed to the weather. The shell, which covers the upper part of the body, differs from that of the tortoise, in being composéd of more pieces than one, which lie in bands over the body, and, as in the tail of the lobster, slide over each other, and are connected by a yellow membrane in the same manner. By this means the animal has a motion in its back, and the armour gives way to its necessary inflexions. These bands are of various numbers and sizes, and from them these animals have been distinguished into various kinds. In general however, there are two large pieces that cover, one the shoulders, and the other the rump. In the back, between these, the bands are placed in different numbers, that lap over each other, and give play to the whole. Besides their opening cross-ways, they also open down along the back, so that the animal can move in every direction. In some there are but three of these bands between the large pieces; in others there are six; in a third kind there are eight; in a fourth kind, nine; in a fifth kind, twelve; and, lastly, in the sixth kind there is but one large piece, which covers the shoulders, and the rest of the body is covered with bands all down to the tail. These shells are differently coloured in different kinds, but most usually they are of a dirty grey. This colour, in all, arises from another peculiar circumstance in their conformation, for the shell itself is covered with a softish skin, which is smooth and transparent.

But, although these shells might easily defend this animal from a feeble enemy, yet they could make but a slight resistance against a more powerful antagonist; nature, therefore, has given the armadillo the same method of protecting itself with the hedgehog or the pangolin. The instant it perceives itself attacked, it withdraws the head under its shells, and lets nothing be seen but the tip of the nose; if the danger increases, the animal's precautions increase in proportion; it then tucks up its feet under its belly, unites its two extremities together, while the tail seems as a band to strengthen the connection; and it thus becomes like a ball, a little flattish on each side. In this position it continues obstinately fixed, while the danger is near, and often long after it is over. In this situation it is tossed about at the pleasure of every other quadruped, and very little resembling a creature endowed with life and motion. Whenever the In-

dians take it, which is in this form, by laying it close to the fire, they soon oblige the poor animal to unfold itself, and to face a milder death to escape a more severe.

This animal is a native only of America, for they were utterly unknown before the discovery of that continent. It is an inoffensive harmless creature, unless it finds the way into a garden, where it does a great deal of mischief, by eating the melons, the potatoes, and other vegetables. Although a native of the warmest parts of America, yet it bears the cold of our climate without any inconvenience. We have often seen them shown among other wild beasts, which is a proof they are not difficult to be brought over. Their motion seems to be a swift walk, but they can neither run, leap, nor climb trees ; so that, if found in an open place, they have no method of escaping from their pursuers. Their only resource in such an extremity is to make towards their hole as fast as they can ; or, if this be impracticable, to make a new hole before the enemy arrives. For this they require but a very few moments' advantage ; the mole itself does not burrow swifter than they can. For this purpose, they are furnished with claws extremely large, strong, and crooked, and usually four upon each foot. They are sometimes caught by the tail as they are making their way into the earth ; but such is their resistance, and so difficult is it to draw them backward, that they leave their tail in the hand of their pursuer, and are very well contented to save their lives with its loss. The pursuers, sensible of this, never drag the tail with all their force, but hold it while another digs the ground about them, and thus these animals are taken alive. The instant the armadillo perceives itself in the power of its enemies, it has but one last resource, to roll itself up, and thus patiently wait whatever tortures they think proper to inflict. The flesh of the smaller kinds is said to be delicate eating ; so that we may suppose they receive no mercy. For this reason they are pursued with unceasing industry ; and, although they burrow very deep in the earth, there have been many expedients used to force them out. The hunters sometimes contrive to fill the hole with smoke, which is often successful ; they at other times force it by pouring in water. They also bring up a small kind of dogs to the chase, that quickly overtake them, if at any distance from their burrow, and oblige them to roll themselves up in a ball, in which

figure the hunters carry them home. If, however, the armadillo be near a precipice, it often escapes by rolling itself up, and then tumbling down from rock to rock, without the least danger or inconvenience. They are sometimes taken in snares laid for them by the sides of rivers and low moist places, which they particularly frequent; and this method, in general, succeeds better than any of the former, as their burrows are very deep, and they seldom stir out except in the night. At no time are they found at any great distance from their retreats, so that it requires some patience and skill to intercept their retreat.

There are scarcely any of these that do not root the ground like a hog, in search of such roots as make a principal part of their food. They live also upon melons and other succulent vegetables, and all will eat flesh when they can get it. They frequent water and watery places, where they feed upon worms, small fish, and water insects. It is pretended that there is a kind of friendship between them and the rattle-snake, that they live peaceably and commodiously together, and are frequently found in the same hole. This, however, may be a friendship of necessity to the armadillo; the rattle-snake takes possession of its retreats, which neither are willing to quit, while each is incapable of injuring the other.

As to the rest, these animals, though they all resemble each other in the general character of being clothed with a shell, yet differ a good deal in their size, and in the parts into which their shell is divided. The first of this kind, which has but three bands between the two large pieces that cover the back, is called the TATU APARA. I will not enter into an exact description of its figure, which, how well written soever, no imagination could exactly conceive; and the reader would be more fatigued to understand, than I to write it. The tail is shorter in this than any other kind, being not more than two inches long, while the shell, taking all the pieces together, is a foot long, and eight inches broad. The second is the TATOU of Ray, or the ENCOUBERT of Buffon; this is distinguished from the rest by six bands across the back; it is about the size of a pig of a month old, with a small long head and a very long tail. The third is the TATUETTE, furnished with eight bands, and not by a great deal so big as the former. Its tail is longer also, and its legs shorter in proportion. Its body from the nose to the insertion of the tail,

is about ten inches long, and the tail seven. The fourth is the PIG-HEADED ARMADILLO, with nine bands. This is much larger than the former, being about two feet long from the nose to the tail. The fifth is the KABASSOU, or CATAPHRACTUS, with twelve bands, and still bigger than the former, or any other of its kind. This is often found above three feet long; but is never eaten as the rest are. The sixth is the WEASEL-HEADED ARMADILLO, with eighteen bands, with a large piece before, and nothing but bands backward. This is above a foot long, and the tail five inches. Of all these, the kabassou and the encoubert are the largest; the rest are of a much smaller kind. In the larger kinds, the shell is much more solid than in the others, and the flesh is much harder and unfit for the table. These are generally seen to reside in dry upland grounds, while the small pieces are always found in moist places, and in the neighbourhood of brooks and rivers. They all roll themselves into a ball; but those whose bands are fewest in number, are least capable of covering themselves up completely. The tatu apara, for instance, when rolled up, presents two great interstices between its bands, by which it is very easily vulnerable, even by the feeblest of quadrupeds

CHAP. IV.

ANIMALS OF THE BAT KIND.

HAVING in the last chapter described a race of animals that unite the boundaries between quadrupeds and insects, I come in this to a very different class, that serve to fill up the chasm between quadrupeds and birds. Some naturalists, indeed, have found animals of the bat kind so much partaking of the nature of both, that they have been at a loss in which rank to place them, and have doubted, in giving the history of the bat, whether it was a beast or a bird they were describing. These doubts, however, no longer exist; they are now universally made to take their place among quadrupeds, to which their bringing forth their young alive, their hair, their teeth, as well as the rest of their habitudes and conformation, evidently entitle them. Pliny, Gesner, and Aldrovandus, who placed them among birds, did not consider that they wanted every character of that order of animals, except

the power of flying. Indeed, when this animal is seen with an awkward and struggling motion supporting itself in the air at the dusk of the evening, it presents in some measure the appearance of a bird; but naturalists, whose business it is to examine it more closely, to watch its habitudes, and inspect into its formation, are inexcusable for concurring in the mistake.

The bat in scarcely any particular resembles the bird, except in its power of sustaining itself in the air. It brings forth its young alive; it suckles them; its mouth is furnished with teeth; its lungs are formed like those of quadrupeds; its intestines and its skeleton have a complete resemblance, and even are, in some measure, seen to resemble those of mankind.¹

The bat most common in England, is about the size of a mouse; or nearly two inches and a half long. The membranes that are usually called wings, are, properly speaking, an extension of the skin all round the body, except the head, which, when the animal flies, is kept stretched on every side by the four interior toes of the fore feet, which are enormously long, and serve like masts that keep the canvass of a sail spread, and regulate its motions.² The first toe is quite loose, and serves as a heel when the bat walks: or as a hook, when it would adhere to any thing. The hind feet are disengaged from the surrounding skin, and divided into five toes, somewhat resembling those of a mouse. The skin by which it flies is of a dusky colour. The body is covered with a short fur of a mouse colour, tinged with red. The eyes are very small; the ears like those of a mouse.

This species of the bat is very common in England. It makes its first appearance early in summer, and begins its flight in the dusk of the evening. It principally frequents the sides of woods, glades, and shady walks; and is frequently observed to skim along the surface of pieces of water. It pursues gnats, moths, and nocturnal insects of every kind. It feeds upon these; but will not refuse meat whenever it can find it. Its flight is a laborious irregular movement; and if it happens to be interrupted in its course it cannot readily prepare for a second elevation; so that if it strikes against any object, and falls to the ground, it is usually taken.³ It appears only in the most pleasant evenings, when

1 Penis propendens.

2 British Zoology.

3 Mr White, in his natural history of Selborne, giving an account of a tame bat, says, "I saw it several times confute the vulgar opinion that bats,

its prey is generally abroad, and flies in pursuit with its mouth open. At other times it continues in its retreat; the chink of a ruined building, or the hollow of a tree. Thus this little animal, even in summer, sleeps the greater part of its time, never venturing out by day-light, nor in rainy weather; never hunting in quest of prey, but for a small part of the night, and then returning to its hole. But its short life is still more abridged by continuing in a torpid state during the winter. At the approach of the cold season, the bat prepares for its state of lifeless inactivity, and seems rather to choose a place where it may continue safe from interruption, than where it may be warmly or conveniently lodged. For this reason it is usually seen hanging by its hooked claws to the roofs of caves, regardless of the eternal damps that surround it. The bat seems the only animal that will venture to remain in these frightful subterranean abodes, where it continues in a torpid state, unaffected by every change of the weather. Such of this kind as are not provident enough to procure themselves a deep retreat, where the cold and heat seldom vary, are sometimes exposed to great inconveniences, for the weather often becomes so mild in the midst of winter, as to warm them prematurely into life, and to allure them from their hole in quest of food, when nature has not provided a supply. These, therefore, have seldom strength to return; but having exhausted themselves in a vain pursuit after insects which are not to be found, are destroyed by the owl, or any other animal that follows such petty prey.

The bat couples and brings forth in summer, generally from two to five at a time: of this I am certain, that I have found five young ones in a hole together; but whether they were the issue of one parent, I cannot tell. The female has but two nipples, and those forward on the breast as in the human kind. This was a sufficient motive for Linnæus to give it the title of a *primus*, to rank it in the same order with mankind, and to push this contemptible animal among the chiefs of the creation. Such arbitrary associations produce rather ridicule than instruction, and render even method contemptible; however, we are to forgive too strong an attachment to system in this able natural-

when down on a flat surface, cannot get on the wing again, by rising with great ease from the floor."

since his application to the particular history of the animal counterbalances the defect.¹

From Linnæus we learn, that the female makes no nest for her young, as most birds and quadrupeds are known to do. She is barely content with the first hole she meets, where sticking herself by her hooks against the sides of her apartment, she permits her young to hang at the nipple, and in this manner to continue for the first or second day. When, after some time, the dam begins to grow hungry, and finds a necessity of stirring abroad, she takes her little ones and sticks them to the wall, in the manner she before hung herself; there they immoveably cling, and patiently wait till her return.

Thus far this animal seems closely allied to the quadruped race. Its similitude to that of birds is less striking. As nature has furnished birds with extremely strong pectoral muscles, to move the wings, and direct their flight, so has it also furnished this animal. As birds also have their legs weak, and unfit for the purposes of motion, the bat has its legs fashioned in the same manner, and is never seen to walk, or, more properly speaking, to push itself forward with its hind legs, but in cases of extreme necessity. The toes of the fore legs, or, if we may use the expression, its extremely long fingers, extend the web like a membrane that lies between them; and this, which is extremely thin, serves to lift the little body into the air: in this manner, by an unceasing percussion, much swifter than that of birds, the animal continues, and directs its flight; however, the great labour required in flying, soon fatigues it; for, unlike birds, which continue for days together upon the wing, the bat is tired in less than an hour, and then returns to its hole, satisfied with its supply, to enjoy the darkness of its retreat.

If we consider the bat as it is seen in our own country, we shall find it a harmless inoffensive creature. It is true that it now and then steals into a larder, and, like a mouse, commits its petty thefts upon the fattest parts of the bacon. But this happens seldom; the general tenor of its industry is employed in pursuing insects that are much more noxious to us than itself can possibly be: while its evening flight, and its unsteady wabbling motion, amuse the imagination, and add one figure more to the pleasing group of animated nature.

¹ Fauna Suecica, p. 8.

The varieties of this animal, especially in our country, are but few ; and the differences scarcely worth enumeration. Naturalists mention the Long-eared Bat, much less than that generally seen, and with much longer ears ; the Horse-shoe Bat, with an odd protuberance round its upper lip, somewhat in the form of a horse-shoe ; the Rhinoceros Bat, with a horn growing from the nose, somewhat similar to that animal from whence it has the name. These, with several others, whose varieties are too numerous, and differences too minute for a detail, are all inoffensive, minute, and contemptible ; incapable, from their size, of injuring mankind, and not sufficiently numerous much to incommode him. But there is a larger race of bats, found in the East and West Indies, that are truly formidable ; each of these is singly a dangerous enemy, but when they unite in flocks, they then become dreadful. Were the inhabitants of the African coasts,¹ says Des Marchais, to eat animals of the bat kind, as they do in the East Indies, they would never want a supply of provisions. They are there in such numbers, that, when they fly, they obscure the setting sun. In the morning, at peep of day, they are seen sticking upon the tops of the trees, and clinging to each other, like bees when they swarm, or like large clusters of cocoa. The Europeans often amuse themselves with shooting among this huge mass of living creatures, and observing their embarrassment when wounded. They sometimes enter the houses, and the negroes are expert at killing them ; but although these people seem for ever hungry, yet they regard the bat with horror, and will not eat it, though ready to starve.

Of foreign bats, the largest we have any certain accounts of, is the Ronsette, or the Great Bat of Madagascar. This formidable creature is near four feet broad, when the wings are extended ; and a foot long, from the tip of the nose to the insertion of the tail. It resembles our bat in the form of its wings, in its manner of flying, and in its internal conformation. It differs from it in its enormous size ; in its colour, which is red, like that of a fox ; in its head and nose also, which resemble those of that animal, and which have induced some to call it the flying fox ; it differs also in the number of its teeth ; and in having a claw on the fore foot, which is wanting in ours. This formidable creature is found only in the ancient continent ; par-

¹ Des Marchais, vol. ii. p. 208.

ticularly in Madagascar, along the coasts of Africa and Malabar, where it is usually seen about the size of a large hen. When they repose, they stick themselves to the tops of the tallest trees, and hang with their heads downward. But when they are in motion, nothing can be more formidable : they are seen in clouds, darkening the air, as well by day as by night, destroying the ripe fruits of the country, and sometimes settling upon animals, and man himself : they devour, indiscriminately, fruits, flesh, and insects, and drink the juice of the palm-tree ; they are heard at night in the forests at more than two miles distance, with a horrible din, but at the approach of day they usually begin to retire : nothing is safe from their depredations ; they destroy fowls and domestic animals, unless preserved with the utmost care, and often fasten upon the inhabitants themselves, attack them in the face, and inflict very terrible wounds. In short, as some have already observed, the ancients seem to have taken their ideas of harpies from these fierce and voracious creatures, as they both concur in many parts of the description, being equally deformed, greedy, uncleanly, and cruel.

An animal not so formidable, but more mischievous than these, is the American Vampyre. This is still less than the former, but more deformed, and still more numerous. It is furnished with a horn like the rhinoceros bat ; and its ears are extremely long. The other kinds generally resort to the forest, and the most deserted places ; but these come into towns and cities, and, after sunset, when they begin to fly, cover the streets like a canopy.¹ They are the common pest both of men and animals ; they effectually destroy the one, and often distress the other. “ They are,” says Ulloa, “ the most expert blood-letters in the world. The inhabitants of those warm latitudes being obliged, by the excessive heats, to leave open the doors and windows of the chambers where they sleep, the vampyres enter, and if they find any part of the body exposed, they never fail to fasten upon it. There they continue to suck the blood ; and it often happens that the person dies under the operation. They insinuate their tooth into a vein, with all the art of the most experienced surgeon, continuing to exhaust the body until they are satiated. I have been assured,” continues he, “ by persons of the strictest veracity, that such an accident has happened to them ;

¹ Ulloa, vol i. p. 58.

and that had they not providentially awaked, their sleep would have been their passage into eternity; having lost so large a quantity of blood as hardly to find strength to bind up the orifice. The reason why the puncture is not felt, is, besides the great precaution with which it is made, the gentle refreshing agitation of the bat's wings, which contribute to increase sleep, and soften the pain."

The purport of this account has been confirmed by various other travellers; who all agree that this bat is possessed of a faculty of drawing the blood from persons sleeping; and thus often destroying them before they awake. But still a very strong difficulty remains to be accounted for; the manner in which they inflict the wound. Ulloa, as has been seen, supposes that it is done by a single tooth; but this we know to be impossible, since the animal cannot infix one tooth without all the rest accompanying its motions; the teeth of the bat kind being pretty even, and the mouth but small. Mr Buffon, therefore, supposes the wound to be inflicted by the tongue; which, however, appears to me too large to inflict an unpainful wound; and even less qualified for that purpose than the teeth. Nor can the tongue, as Mr Buffon seems to suppose, serve for the purposes of suction, since for this it must be hollow, like a syringe, which it is not found to be.* I should therefore suppose, that the animal is endowed with a strong power of suction; and that, without inflicting any wound whatsoever, by continuing to draw, it enlarges the pores of the skin in such a manner, that the blood at length passes, and that more freely the longer the operation is continued; so that, at last, when the bat goes off, the blood continues to flow. In confirmation of this opinion we are told, that where beasts have a thick skin, this animal cannot injure them; whereas, in horses, mules, and asses, they are very liable to be thus destroyed. As to the rest, these animals are considered as one of the great pests of South America; and often prevent the peopling of many parts of that continent: having destroyed at Barja, and several other places, such cattle as were brought there by the missionaries, in order to form a settlement.

* A portion of the tongue has now been discovered to be exactly constituted as an organ of suction, which confirms the conjecture of Buffon.

CHAP. V.

OF AMPHIBIOUS QUADRUPEDS.

THE gradations of nature, from one class of beings to another, are made by imperceptible deviations. As we saw in the foregoing chapters, quadrupeds almost degraded into the insect tribe, or mounted among the inhabitants of the air, we are at present to observe their approach to fishes, to trace the degrees by which they become more unlike terrestrial animals, till the similitude of the fish prevails over that of the quadruped.

As in opposite armies the two bodies are distinct and separated from each other, while yet between them are various troops that plunder on both sides, and are friends to neither; so between terrestrial and aquatic animals there are tribes that can scarcely be referred to any rank, but lead an amphibious life between them. Sometimes in water, sometimes on land, they seem fitted for each element, and yet completely adapted to neither. Wanting the agility of quadrupeds upon land, and the perseverance of fishes in the deep, the variety of their powers only seems to diminish their force; and, though possessed of two different methods of living, they are more inconveniently provided than such as have but one.

All quadrupeds of this kind, though covered with hair in the usual manner, are furnished with membranes between the toes, which assist their motion in the water. Their paws are broad, and their legs short, by which they are more completely fitted for swimming; for, taking short strokes at a time, they make them oftener and with greater rapidity. Some, however, of these animals are more adapted to live in the water than others; but, as their power increases to live in the deep, their unfitness for living upon land increases in the same proportion. Some, like the otter, resemble quadrupeds in every thing except in being in some measure web-footed; others depart still further, in being, like the beaver, not only web-footed, but having the tail covered with scales, like those of a fish. Others depart yet farther, as the seal and the morse, by having the hind feet stuck to the body like fins; and others, as the lamentin, almost entirely resemble fishes, by having no hind feet whatsoever. Such are the

gradations of the amphibious tribe. They all, however, get their living in the water, either by habit or conformation ; they all continue a long time under water ; they all consider that element as their proper abode ; whenever pressed by danger, they fly to the water for security ; and, when upon land, appear watchful, timorous, and unwieldy.

THE OTTER.¹

In the first step of the progression from land to amphibious animals, we find the Otter, resembling those of the terrestrial kind in shape, hair, and internal conformation ; resembling the aquatic tribes in its manner of living, and in having membranes between the toes to assist it in swimming. - From this peculiar make of its feet, which are very short, it swims even faster than it runs, and can overtake fishes in their own element. The colour of this animal is brown ; and it is somewhat of the shape of an overgrown weasel, being long, slender, and soft skinned. However, if we examine its figure in detail, we shall find it unlike any other animal hitherto described, and of such a shape as words can but weakly convey. Its usual length is about two feet, from the tip of the nose to the insertion of the tail ; the head and nose are broad and flat ; the mouth bears some similitude to that of a fish ; the neck is short, and equal in thickness to the head ; the body long ; the tail broad at the insertion, but tapering off to a point at the end ; the eyes are very small, and placed nearer the nose than usual in quadrupeds. The legs are very short, but remarkably strong, broad, and muscular. The joints are articulated so loosely, that the animal is capable of turning them quite back, and bringing them on a line with the body, so as to perform the office of fins. Each foot is furnished with five toes, connected by strong broad webs like those of water fowl. Thus nature, in every part, has had attention to the life of an animal whose food is fish, and whose haunts must necessarily be about water.

This voracious animal is never found but at the sides of lakes and rivers, but particularly the former, for it is seldom fond of fishing in a running stream, for the current of the water having

¹ The otter differs in no respect from the weasel kind, except in having the feet webbed, and in living almost constantly in the water, from whence they chiefly derive their food, which is fish.

more power upon it than the fishes it pursues, if it hunts against the stream, it swims too slow ; and if with the stream, it overshoots its prey. However, when in rivers, it is always observed to swim against the stream, and to meet the fishes it preys upon, rather than to pursue them. In lakes it destroys much more than it devours, and is often seen to spoil a pond in the space of a few nights. But the damage they do by destroying fish is not so great as their tearing in pieces the nets of the fishers, which they infallibly do whenever they happen to be entangled. The instant they find themselves caught, they go to work with their teeth, and in a few minutes destroy nets of a very considerable value.

The otter has two different methods of fishing ; the one by catching its prey from the bottom upward, the other by pursuing it into some little creek, and seizing it there. In the former case, as this animal has longer lungs than most other quadrupeds, upon taking in a quantity of air, it can remain for some minutes at the bottom ; and whatever fish passes over at that time is certainly taken ; for as the eyes of fish are placed so as not to see under them, the otter attacks them off their guard from below ; and, seizing them at once by the belly, drags them on shore, where it often leaves them untouched, to continue the pursuit for hours together. The other method is chiefly practised in lakes and ponds, where there is no current : the fish thus taken are rather of the smaller kind, for the great ones will never be driven out of deep water.

In this manner the otter usually lives during the summer being furnished with a supply much greater than its consumption ; killing for its amusement, and infecting the edges of the lake with quantities of the dead fish, which it leaves there as trophies rather of its victory than its necessities. But in winter, when the lakes are frozen over, and the rivers pour with a rapid torrent, the otter is often greatly distressed for provisions ; and is then obliged to live upon grass, weeds, and even the bark of trees. It then comes upon land, and, grown courageous from necessity, feeds upon terrestrial animals, rats, insects, and even sheep themselves. Nature, however, has given it the power of continuing a long time without food ; and although, during that season, it is not rendered quite torpid, like the marmout or the dormouse, yet it keeps much more within its retreat, which is

usually the hollow of a bank, worn under by the water. There it often forms a kind of gallery, running for several yards along the edge of the water : so that when attacked at one end, it flies to the other, and often evades the fowler by plunging into the water at forty or fifty paces distance, while he expects to find it just before him.

We learn from Mr Buffon, that this animal, in France, couples in winter, and brings forth in the beginning of spring. But it is certainly different with us, for its young are never found till the latter end of summer ; and I have frequently, when a boy, discovered their retreats, and pursued them at that season. I am, therefore, more inclined to follow the account given us of this animal by Mr Lots, of the Academy of Stockholm, who assures us that it couples about the middle of summer, and brings forth at the end of nine weeks, generally three or four at a time. This, as well as the generality of his other remarks on this subject, agrees so exactly with what I remember concerning it, that I will beg leave to take him for my guide, assuring the reader that, however extraordinary the account may seem, I know it to be certainly true.

In the rivers and the lakes frequented by the otter, the bottom is generally stony and uneven, with many trunks of trees, and long roots stretching underneath the water.¹ The shore also is hollow and scooped inward by the waves. These are the places the otter chiefly chooses for its retreat ; and there is scarcely a stone which does not bear the mark of its residence, as upon them its excrements are always made. It is chiefly by this mark that its lurking-places are known, as well as by the quantity of dead fish that are found lying here and there upon the banks of the water. To take the old ones alive is no easy task, as they are extremely strong, and there are few dogs that will dare to encounter them. They bite with great fierceness, and never let go their hold when they have once fastened. The best way therefore is to shoot them at once, as they never will be thoroughly tamed ; and, if kept for the purposes of fishing, are always apt to take the first opportunity of escaping. But the young ones may be more easily taken, and converted to very useful purposes. The otter brings forth its young generally under the

1 *Journal Etranger*, Juin 1755, p. 14.

hollow banks, upon a bed of rushes, flags, or such reeds as the place affords it in the greatest quantities. I see in the British Zoology a description of its habitation, where that naturalist observes, "that it burrows under ground, on the banks of some river or lake, and always makes the entrance of its hole under water, then works up to the surface of the earth, and there makes a minute orifice for the admission of air, and this little air-hole is often found in the middle of some thicket." In some places this may be true, but I have never observed any such contrivance; the retreat, indeed, was always at the edge of the water, but it was only sheltered by the impending bank; and the otter itself seemed to have but a small share in its formation. But be this as it may, the young ones are always found at the edge of the water; and, if under the protection of the dam, she teaches them instantly to plunge, like herself, into the deep, and escape among the rushes or weeds that fringe the stream. At such times, therefore, it is very difficult to take them; for, though never so young, they swim with great rapidity, and in such a manner that no part of them is seen above water, except the tip of the nose. It is only when the dam is absent that they can be taken; and in some places, there are dogs purposely trained for discovering their retreats. Whenever the dog comes to the place, he soon, by his barking, shows that the otter is there; which, if there be an old one, instantly plunges into the water, and the young all follow. But if the old one be absent, they continue terrified, and will not venture forth but under her guidance and protection. In this manner they are secured, and taken home alive, where they are carefully fed with small fish and water. In proportion, however, as they gather strength, they have milk mixed among their food, the quantity of their fish provision is retrenched, and that of vegetables is increased, until at length they are fed wholly upon bread, which perfectly agrees with their constitution. The manner of training them up to hunt for fish requires not only assiduity, but patience; however, their activity and use, when taught, greatly repays the trouble of teaching; and, perhaps, no other animal is more beneficial to its master. The usual way is, first to learn them to fetch, as dogs are instructed; but, as they have not the same docility, so it requires more art and experience to teach them. It is usually performed by accustoming them to take a truss

stuffed with wool, of the shape of a fish, and made of leather, in their mouths, and to drop it at the word of command; to run after it when thrown forward, and to bring it to their master. From this they proceed to real fish, which are thrown dead into the water, and which they are taught to fetch from thence. From the dead they proceed to the live, until at last the animal is perfectly instructed in the whole art of fishing. An otter thus taught is a very valuable animal, and will catch fish enough to sustain not only itself but a whole family. I have seen one of these go to a gentleman's pond at the word of command, drive up the fish into a corner, and seizing upon the largest of the whole, bring it off, in its mouth, to its master.

Otters are to be met with in most parts of the world, and rather differ in size and colour from each other, than in habits or conformation.¹ In North America, and Carolina, they are usually found white, inclining to yellow. The Brazilian otter is much larger than ours, with a roundish head, almost like a cat. The tail is shorter, being but five inches long; and the hair is soft, short, and black, except on the head, where it is of a dark brown, with a yellowish spot under the throat.*

1 Ray.

* *The Sea Otter*.—The whole length of the sea otter is generally about four feet, of which the tail occupies thirteen inches. The fur is extremely soft, and of a deep glossy black. The ears are small, and erect, and the whiskers long and white. The legs are short and thick, the hinder ones somewhat resembling those of a seal. The weight of the largest sea otters is from seventy to eighty pounds. In their general habits of life these animals are perfectly harmless and inoffensive; and towards their offspring they exhibit a degree of attachment which is extremely interesting. They will never desert them; they will even starve themselves to death on being robbed of them, and strive to breathe their last on the spot where their young have been destroyed. The female produces only a single young one at a time, which she suckles almost a whole year, and till it takes to itself a mate. The sea otters pair, and are very constant. They often carry their young between their teeth, and fondle them, frequently throwing them up, and catching them again in their paws. Before these can swim, the old ones will take them in their fore-feet, and swim about with them on their backs. The sea otters swim sometimes on their sides; at other times on their backs, or in an upright position. They are very sportive, embrace each other, and seem to kiss. When attacked they make no resistance, but endeavour to save themselves by flight: if, however, they are closely pressed, and can see no means of escape, they scold and grin like an angry cat. On receiving a blow, they immediately lie on their side, draw up their hind legs together, cover their eyes with their fore paws, and thus seem to pre-

THE BEAVER.

IN all countries, as man is civilized and improved, the lower ranks are repressed and degraded.² Either reduced to servitude, or treated as rebels, all their societies are dissolved, and all their united talents rendered ineffectual. Their feeble arts quickly disappear, and nothing remains but their solitary instincts, or those foreign habitudes which they receive from human education. For this reason there remain no traces of their ancient talents and industry, except in those countries where man himself is a stranger; where unvisited by his controlling power, for a long succession of ages, their little talents have had time to come to their limited perfection, and their common designs have been capable of being united.

The beaver seems to be now the only remaining monument of brutal society. From the result of its labours, which are still to be seen in the remote parts of America, we learn how far instinct can be aided by imitation. We from thence perceive to what a degree animals, without language or reason, can concur for their mutual advantage, and attain by numbers those ad-

pare for death. But if they are fortunate enough to escape their pursuer, they deride him as soon as they are safe in the sea, with various diverting tricks; at one time keeping themselves on end in the water, and jumping over the waves, holding the fore paw over the eyes, as if to shade them from the sun while looking out for their enemy; then lying flat on their back, and stroking their belly; then throwing their young down into the water, and fetch them up again. In their escape they carry the sucklings in their mouths, and drive before them those that are full-grown. The skins of the sea otters are of great value, and have long formed a considerable export from Russia. They are disposed of to the Chinese at the rate of eighty or a hundred rubles each.—The trade for this fur at Nootka had, not many years ago, nearly produced a war between Great Britain and Spain. These animals are found on the coast of Kamtschatka, and in the adjacent islands, as well as on the opposite coasts of America; but they are confined within a very few degrees of latitude.

The Cayenne Otter.—The toes on the fore-feet are unconnected; the tail is long, taper, and naked. It inhabits Cayenne; it is about seven inches in length. The body with large brownish-black spots; it is of a yellowish grey colour between; the under parts are white; over each eye is a white spot; the ears are large and round; the mouth is whiskered; the tail is round above, flat beneath, and of a whitish colour at the tip. It is covered with a rough graulated skin.

vantages which each in a state of solitude seems unfitted to possess.

If we examine the beaver merely as an individual, and unconnected with others of its kind, we shall find many other quadrupeds to exceed it in cunning, and almost all in the powers of annoyance and defence. The beaver, when taken from its fellows, and kept in a state of solitude or domestic tameness, appears to be a mild gentle creature, familiar enough, but somewhat dull, and even melancholy; without any violent passions or vehement appetites, moving but seldom, making no efforts to attain any good, except in gnawing the wall of its prison, in order to regain its freedom; yet this, however, without anger or precipitation, but calm and indifferent to all about, without attachment or antipathies, neither seeking to offend nor desiring to please. It appears inferior to the dog in those qualities which render animals of service to man; it seems made neither to serve, to command, nor to have connections with any other set of beings, and is only adapted for living among its kind. Its talents are entirely repressed in solitude, and are only brought out by society. When alone, it has but little industry, few tricks, and without cunning sufficient to guard it against the most obvious and bungling snares laid for it by the hunter. Far from attacking any other animal, it is scarcely possessed of the arts of defence. Preferring flight to combat, like all wild animals, it only resists when driven to an extremity, and fights only when its speed can no longer avail.

But this animal is rather more remarkable for the singularity of its conformation, than any intellectual superiorities it may be supposed, in a state of solitude, to possess. The beaver is the only creature among quadrupeds that has a flat broad tail, covered with scales, which serves as a rudder to direct its motions in the water. It is the sole quadruped that has membranes between the toes on the hind feet only, and none on the fore feet, which supply the place of hands, as in the squirrel. In short, it is the only animal that in its fore parts entirely resembles a quadruped, and in its hinder parts seems to approach the nature of fishes, by having a scaly tail. In other respects, it is about two feet long, and near one foot high; it is somewhat shaped like a rat, except the tail, which, as has been observed, is flat and scaly, somewhat resembling a neat's tongue at

the point. Its colour is of a light brown; the hair of two sorts; the one longer and coarser, the other soft, fine, short, and silky. The teeth are like those of a rat or a squirrel, but longer and stronger, and admirably adapted to cutting timber or stripping bark, to which purposes they are constantly applied. One singularity more may be mentioned in its conformation; which is, that, like birds, it has but one and the same vent for the emission of its excrements and its urine; a strange peculiarity, but which anatomists leave us no room to doubt of.

The beavers begin to assemble about the months of June and July, to form a society that is to continue for the greatest part of the year. They arrive in numbers from every side, and generally form a company of above two hundred. The place of meeting is commonly the place where they fix their abode, and this is always by the side of some lake or river. If it be a lake, in which the waters are always upon a level, they dispense with building a dam; but if it be a running stream, which is subject to floods and falls, they then set about building a dam, or pier, that crosses the river, so that it forms a dead water in that part which lies above and below. This dam, or pier, is often four-score or a hundred feet long, and ten or twelve feet thick at the base. If we compare the greatness of the work with the powers of the architect, it will appear enormous; but the solidity with which it is built is still more astonishing than its size. The part of the river over which this dam is usually built, is where it is most shallow, and where some great tree is found growing by the side of the stream. This they pitch upon as proper for making the principal part in their building; and, although it is often thicker than a man's body, they instantly set about cutting it down. For this operation they have no other instrument but their teeth, which soon lay it level, and that also on the side they wish it to fall, which is always across the stream. They then fall about cutting off the top branches, to make it lie close and even, and serve as the principal beam of their fabric.¹

This dike, or causey, is sometimes ten, and sometimes twelve feet thick, at the foundation. It descends in a declivity, or slope, on that side next the water, which gravitates upon the work in proportion to the height, and presses it with a prodigious force towards the earth. The opposite side is erected

¹ Spectacle de la Nature.

perpendicular, like our walls ; and that declivity, which, at the bottom, or basis, is about twelve feet broad, diminishes towards the top, where it is no more than two feet broad, or thereabouts. The materials whereof this mole consists, are wood and clay. The beavers cut, with surprising ease, large pieces of wood, some as thick as one's arm or thigh, and about four, five, or six feet in length, or sometimes more, according as the slope ascends. They drive one end of these stakes into the ground, at a small distance one from the other, intermingling a few with them that are smaller and more pliant. As the water, however, would find a passage through the intervals or spaces between them, and leave the reservoir dry, they have recourse to a clay which they know where to find, and with which they stop up all the cavities both within and without, so that the water is duly confined. They continue to raise the dike in proportion to the elevation of the water, and the plenty which they have of it. They are conscious, likewise, that the conveyance of their materials by land would not be so easily accomplished as by water ; and therefore they take the advantage of its increase, and swim with their mortar on their tails, and their stakes between their teeth, to the place where there is most occasion for them. If their works are, either by the force of the water, or the feet of the huntsmen who run over them, in the least damnified, the breach is instantly made up ; every nook and corner of the habitation is reviewed, and, with the utmost diligence and application, perfectly repaired. But when they find the huntsmen visit them too often, they work only in the night-time, or else abandon their works entirely, and seek out for some safer situation.

The dike or mole, being thus completed, their next care is to erect their several apartments, which are either round or oval, and divided into three stories, one raised above the other : the first below the level of the causey, which is for the most part full of water ; the other two above it. This little fabric is built in a very firm and substantial manner, on the edge of their reservoir, and always in such divisions or apartments as above mentioned ; that in case of the water's increase, they may move up a story higher, and be no ways incommoded. If they find any little island contiguous to their reservoir, they fix their mansion there, which is then more solid, and not so frequently ex-

posed to the overflowing of the water, in which they are not able to continue for any length of time. In case they cannot pitch upon so commodious a situation, they drive piles into the earth, in order to fence and fortify their habitation against the wind as well as the water. They make two apertures, at the bottom, to the stream; one is a passage to their bagnio, which they always keep neat and clean; the other leads to that part of the building where every thing is conveyed that will either soil or damage their upper apartments. They have a third opening, or doorway, much higher, contrived for the prevention of their being shut up and confined, when the frost and snow has closed the apertures of the lower floors. Sometimes they build their houses altogether upon dry land; but then they sink trenches five or six feet deep, in order to descend into the water when they see convenient. They make use of the same materials; and are equally industrious in the erection of their lodges, as their dikes. Their walls are perpendicular, and about two feet thick. As their teeth are more serviceable than saws, they cut off all the wood that projects beyond the wall. After this, when they have mixed up some clay and dry grass together, they work it into a kind of mortar, with which, by the help of their tails they plaster all their works, both within and without.

The inside is vaulted, and is large enough for the reception of eight or ten beavers. In case it rises in an oval figure, it is for the generality above twelve feet long, and eight or ten feet broad. If the number of inhabitants increase to fifteen, twenty, or thirty, the edifice is enlarged in proportion. I have been credibly informed, that four hundred beavers have been discovered to reside in one large mansion-house, divided into a vast number of apartments, that had a free communication one with another.

All these works, more especially in the northern parts, are finished in August, or September at farthest; at which time they begin to lay in their stores. During the summer they are perfect epicures; and regale themselves every day on the choicest fruits and plants the country affords. Their provisions, indeed, in the winter season, principally consist of the wood of the birch, the plane, and some few other trees, which they steep in water from time to time, in such quantities as are proportioned to the number of inhabitants. They cut down

branches from three to ten feet in length. Those of the largest dimensions are conveyed to the magazines by a whole body of beavers ; but the smallest by one only : each of them, however, takes a different way, and has his proper walk assigned him, in order that no one labourer should interrupt another in the prosecution of his work. Their wood-yards are larger or smaller in proportion to the number in the family ; and according to the observation of some curious naturalists, the usual stock of timber, for the accommodation of ten beavers, consists of about thirty feet in a square surface, and ten in depth. These logs are not thrown up in one continued pile, but laid one across the other, with intervals or small spaces between them in order to take out, with the greater facility, but just such a quantity as they shall want for their immediate consumption, and those parcels only, which lie at the bottom in the water and have been duly steeped. This timber is cut again into small particles, and conveyed to one of their largest lodges, where the whole family meet, to consume their respective dividends, which are made impartially, in even and equal portions. Sometimes they traverse the woods and regale their young with a more novel and elegant entertainment.

Such as are used to hunt these animals, know perfectly well that green wood is much more acceptable to them than that which is old and dry ; for which reason they plant a considerable quantity of it round their lodgments ; and as they come out to partake of it, they either catch them in snares, or take them by surprise. In the winter, when the frosts are very severe, they sometimes break a large hole in the ice ; and when the beavers resort thither for the benefit of a little fresh air, they either kill them with their hatchets, or cover the opening with a large substantial net. After this, they undermine and subvert the whole fabric ; whereupon the beavers, in hopes to make their escape in the usual way, fly with the utmost precipitation to the water ; and plunging into the aperture, fall directly into the net and are inevitably taken.

THE SEAL.

EVERY step we proceed in the description of amphibious quadrupeds, we make nearer advances to the tribe of fishes. We first observed the otter, with its feet webbed and formed for

an aquatic life ; we next saw the beaver with the hinder parts covered with scales, resembling those of fishes ; and we now come to a class of animals in which the shape and habits of fishes still more apparently prevail, and whose internal conformation attaches them very closely to the water. The seal, in general, resembles a quadruped in some respects, and a fish in others. The head is round like that of a man ; the nose broad like that of the otter ; the teeth like those of a dog ; the eyes large and sparkling ; no external ears, but holes that serve for that purpose ; the neck is well proportioned and of a moderate length ; but the body thickest where the neck is joined to it. From thence the animal tapers down to the tail, growing all the way smaller like a fish. The whole body is covered with a thick bristly shining hair, which looks as if it were entirely rubbed over with oil ; and thus far the quadruped prevails over the aquatic. But it is in the feet that this animal greatly differs from all the rest of the quadruped kind ; for though furnished with the same number of bones with other quadrupeds, yet they are so stuck on the body and so covered with a membrane, that they more resemble fins than feet ; and might be taken for such, did not the claws with which they are pointed show their proper analogy. In the fore feet or rather hands, all the arm and the cubit are hid under the skin, and nothing appears but the hand from the wrist downwards ; so that if we imagine a child with its arms swathed down, and nothing appearing but its hands at each side of the body, towards the breast, we may have some idea of the formation of this animal in that part. These hands are covered in a thick skin, which serves like a fin for swimming ; and are distinguished by five claws, which are long, black, and piercing. As to the hind feet, they are stretched out on each side of the short tail, covered with a hairy skin like the former, and both together, almost joining at the tail ; the whole looks like the broad flat tail of a fish ; and were it not for five claws which appear, might be considered as such. The dimensions of this animal are various, being found from four feet long to nine. They differ also in their colours ; some being black, others spotted, some white, and many more yellow. It would therefore be almost endless to mention the varieties of this animal. Buffon describes three ; and Kriantz mentions five, all different from those described by the other. I might, were I fond of such honours, claim the

merit of being a first describer myself; but, in fact, the varieties of this animal are so many, that were they all described, the catalogue would be as extensive as it would be useless and unentertaining.* It is sufficient to observe, that they agree in the

* *The Ursine Seal.* The males are about eight feet in length, but the females are much smaller. Their bodies are thick, decreasing somewhat towards the tail. The nose projects like that of a pug-dog; and the eyes are large and prominent. The fore-legs are about two feet in length, and, with the feet, have somewhat the appearance of turtle's fins. The hind-legs are rather shorter, and have five toes separated by a web. The general colour of the hair is black, and that of the old ones is tipped with grey. The females are ash-coloured.

The Ursine seals live in families, every male being surrounded by from eight to fifty females, whom he guards with the utmost jealousy; each family keeps separate from the others, although they lie by thousands on the shores which they inhabit. The males exhibit great affection towards their young, and equal tyranny towards the females.—They are fierce in the protection of the former; and, should any one attempt to carry off their cub, they will stand on the defensive, while the female conveys it in her mouth. Should she happen to drop it, the male instantly quits his enemy, falls on her, and beats her against the stones till he leaves her for dead. But if the young one is entirely carried off, he melts into the greatest affliction, shedding tears, and exhibiting every mark of sorrow.

Those animals that, through age or impotence, are deserted by the females, withdraw themselves from society, and not only become excessively splenetic, peevish, and quarrelsome, but so much attached to their own stations, as to prefer death to the loss of them. If they perceive another animal approaching them, they are instantly roused from their indolence, snap at the encroacher, and give him battle. During the fight, they sometimes intrude on the station of their neighbour, who then joins in the contest; so that at length the civil discord spreads through the whole shore, attended with hideous growls, their note of war. This is one of the causes of the disputes which take place among these irritable creatures. But a much more serious cause is, when an attempt is made to seduce away any of their females. A battle is the sure consequence of the insult; and sad indeed is the fate of the vanquished animal; he instantly loses his whole seraglio, who all desert him, and attach themselves to the victor. When only two of the animals are engaged in combat, they rest at intervals, lying down near each other; then rising both at once, renew the battle. They fight with their heads erect, and turn them aside to avoid the blows. As long as their strength continues equal, they only use their fore-paws; but if one of them fails, the other seizes him with his teeth, and throws him on the ground. The wounds they inflict are very deep, and like the cut of a sabre; and, it is said, that in the month of July, scarcely one is to be seen that has not some mark of this description. At the conclusion of an engagement, such as are able throw themselves into the sea, in order to wash off the blood. They are exceedingly tenacious of life, and will sometimes live a fortnight after receiving such wounds as would immediately have destroyed any other animal.

The Hooded Seal. The head is without ears; there are four fore-teeth in

general external characters already mentioned, and internally in two or three more, which are so remarkable as to deserve peculiar attention.

It has been often remarked, that all animals are sagacious in proportion to the size of their brain. It has, in support of this opinion, been alleged, that man, with respect to his bulk, has, of

each jaw : the fore-feet are undivided ; the hind-feet are without nails. It inhabits the coast of Dalmatia. The skin of the neck folds into the resemblance of a monk's hood ; the hair is short, dusky, and spotted with ash above the navel is a tawny spot. It is from seven to eight feet in length.

The Bottle-Nosed Seal. The male of this species is extremely large, sometimes measuring from fifteen to twenty feet in length ; he is also distinguished from the female by a large snout, projecting five or six inches below the end of the upper jaw. The feet are short, and the hinder ones so webbed as to appear like fins. The general colour of the hair is ferruginous. Their fat is so considerable, as to lie ten or twelve inches deep between the skin and the flesh. Hence, when they are in motion, they appear almost like immense skins filled with oil, the tremulous motion of the blubber being plainly discernible beneath the surface. They have also so much blood, that if deeply wounded in a dozen places, it will gush out at every one, and spout to a considerable distance. Their usual voice is a kind of grunting, or sometimes a snorting like that of a horse in full vigour. They are of a lethargic disposition, and when at rest they are not easily disturbed. Their time seems pretty equally divided between the land and the sea, as they continue out during the summer, and come on shore at the commencement of winter. —They feed on the grass and verdure which grows on the banks of the fresh water streams ; and when not employed in feeding, they sleep in herds in the most miry places they can find. Each herd seems to be under the direction of a large male, which mariners ludicrously style the bashaw, from his driving off the other males from a number of females which he appropriates to himself.—These bashaws, however, do not arrive at this envied superiority without many fierce and sanguinary conflicts, of which their numerous scars generally bear evidence. Some of Lord Anson's people observed one day on the island of Juan Fernandez, what they at first supposed to be animals of a kind different from any they had previously seen ; but, on a nearer approach, they proved to be two of these seals, which had been goring each other with their teeth, till both were completely covered with blood. It is not difficult to kill them ; for their propensity to sleep, and their sluggish and unwieldy motions, generally render them an easy prey to their enemies. Sometimes, however, they make a vigorous resistance ; and, it is said, that as a sailor was one day employed in skinning one of the young, the female from whom he had taken it, came upon him unperceived, and getting his head into her mouth, lacerated his skull so dreadfully, that he died in a few days afterwards. According to Lord Anson's account, the flesh of these quadrupeds is somewhat like beef, and the hearts and tongues are excellent eating.

These animals are principally found on the coast of Zealand, on the island of Juan Fernandez, and the Falkland Islands. The females produce two young ones in the winter, which they suckle for some time. These, when first brought forth, are about the size of a full-grown common seal

all others, the largest. In pursuance of this assumption, some erroneous speculations have been formed. But, were the size of the brain to determine the quantity of the understanding, the seal would, of all other animals, be the most sagacious; for it has, in proportion, the largest brain of any, even man himself not excepted. However, this animal is possessed of but very few advantages over other quadrupeds; and the size of its brain furnishes it with few powers that contribute to its wisdom or its preservation.*

* Although deficient in their organs of sense, and the general formation of their members, seals display unusual sagacity, which goes to prove the influence of the brain in all that is intellectual. Of three seals in the French menagerie, upon which M. F. Cuvier made observations, none of them experienced fear in the presence of man, or any other animal. Nothing ever induced them to fly, except approaching so near as to excite in them the apprehension of being trodden under foot, and even in this case they only avoided the danger by removing to a little distance. One of them, indeed, would sometimes threaten with its voice, and strike with its paw; but it would never bite, except in the last extremity. In taking their food, they evinced a similar gentleness of character. Though very voracious, they could behold it withdrawn from them without fear or resistance. They would suffer the fish which had been just given them to be taken away with impunity, and some young dogs, to which one of those seals was attached, would amuse themselves in snatching the fish from his mouth which he was just ready to swallow, without his testifying the least anger. When two seals, however, were allowed to eat together, the usual result was a combat carried on with their paws, which ended by the weakest or most timid leaving the field in possession of his antagonist.

With the exception of some species of the monkey, there is scarcely any wild animal more easily tamed than the seal, or capable of a stronger degree of attachment. One of the individuals before-mentioned, showed, at first, some degree of shyness, and fled at the show of caresses; but, in a few days, his fear was totally at an end. He soon discovered the nature and intent of such movements, and his confidence became unbounded. This same phoca was shut up with two little dogs, who used to mount upon his back, bark at, and seemed to bite him; and although sports of this kind were at variance with his habits and nature, he soon learned to appreciate their motive, and to take pleasure in them. He never replied to them, but by gentle strokes of his paw, which seemed rather intended to excite than to repress them. If the dogs escaped he would follow them, though walking over ground covered with stones and mud must have been a painful effort to him; and when cold weather came, he and the dogs would lie closely together, to keep each other warm.

Another was peculiarly attached to the person who had the care of him; he soon learned to know this person at any distance within his range of vision. He would hold his eyes fixed upon him while he was present, and run forward the moment he saw him approach. Hunger, to be sure, entered for something into the affection he testified towards his keepers. The

This animal differs also in the formation of its tongue from all other quadrupeds. It is forked or slit at the end, like that of serpents; but, for what purpose it is thus singularly contrived we are at a loss to know. We are much better informed with respect to a third singularity in its conformation, which is, that the *foramen ovale* in the heart is open. Those who are in the least acquainted with anatomy, know, that the veins uniting bring their blood to the heart, which sends it into the lungs, and from thence it returns to the heart again to be distributed through the whole body. Animals, however, before they are born, make no use of their lungs; and therefore their blood, without entering their lungs, takes a shorter passage through the very partition of the heart, from one of its chambers to the other, thus passing from the veins directly into those vessels that drive it through the whole frame. But the moment the animal is brought forth, the passage through the partition, which passage is called the *foramen ovale*, closes up, and continues closed for ever; for the blood then takes its longest course through the lungs to return to the other chamber of the heart again. Now the seal's heart resembles that of an infant in the womb, for the *foramen ovale* never closes; and although the blood of this animal commonly circulates through the lungs, yet it can circulate without their assistance, as was observed above, by a shorter way. From hence, therefore, we see the manner in which this animal is adapted for continuing under water; for, being under no immediate necessity of breathing, the vital motions are still carried on while it continues at the bottom: so that it can pursue its prey in that element, and yet enjoy all the delights and advantages of ours.

continual attention which he paid to every motion connected with the gratification of his appetite had made him remark, at the distance of sixty paces, the place which contained his food, although it was devoted to several other uses, and though it was entered but twice a day for the purpose of procuring his nutriment. If he was at liberty when his keeper approached to feed him, he would run forward, and solicit his food by lively motions of his head and the most expressive glances of his eye. This animal exhibited many other instances of considerable intelligence.

M. F. Cuvier has since seen an individual of this species, as well-educated as any dog could be.

I have followed the usual observations of naturalists with respect to the *foramen ovale* in this animal: I have many reasons, however, to incline me to think that the *foramen* is not entirely open. But this is not the place for a critical inquiry of this kind.

The water is the seal's usual habitation, and whatever fish it can catch its food. Though not equal in instinct and cunning to some terrestrial animals, it is greatly superior to the mute tenants of that element in which it chiefly resides. Although it can continue for several minutes under water, yet it is not able, like fishes, to remain there for any length of time; and a seal may be drowned, like any other terrestrial animal. Thus it seems superior, in some respects, to the inhabitants of both elements, and inferior in many more. Although furnished with legs, it is, in some measure, deprived of all the advantages of them.¹ They are shut up within its body, while nothing appears but the extremities of them, and these furnished with very little motion, but to serve them as fins in the water. The hind feet, indeed, being turned backwards, are entirely useless upon land so that when the animal is obliged to move, it drags itself forward like a reptile, and with an effort more painful. For this purpose it is obliged to use its fore-feet, which, though very short, serve to give it such a degree of swiftness that a man can not readily overtake it; and it runs towards the sea. As it is thus awkwardly formed for going upon land, it is seldom found at any distance from the sea-shore, but continues to bask upon the rocks; and when disturbed always plunges down at once to the bottom.

The seal is a social animal, and wherever it frequents, numbers are generally seen together. They are found in every climate, but in the north and icy seas they are particularly numerous. It is on those shores, which are less inhabited than ours, and where the fish resort in greater abundance, that they are seen by thousands, like flocks of sheep, basking on the rocks, and suckling their young. There they keep watch like other gregarious animals; and, if an enemy appear, instantly plunge all together into the water. In fine weather they more usually employ their time in fishing; and generally come on shore in tempests and storms. The seal seems the only animal that takes delight in these tremendous conflicts of nature. In the midst of thunders and torrents, when every other creature takes refuge from the fury of the elements, the seals are seen by thousands sporting along the shore, and delighted with the universal disorder! This, however, may arise from the sea being at

¹ Buffon.

that time too turbulent for them to reside in ; and they may then particularly come upon land when unable to resist the shock of their more usual element.

As seals are gregarious, so are they also animals of passage, and perhaps the only quadrupeds that migrate from one part of the world to another. The generality of quadrupeds are contented with their native plains and forests, and seldom stray, except when necessity or fear impels them. But seals change their habitation, and are seen in vast multitudes directing their course from one continent to another.¹ On the northern coasts of Greenland they are seen to retire in July, and to return again in September. This time it is supposed they go in pursuit of food. But they make a second departure in March, to cast their young, and return in the beginning of June, young and all, in a great body together, observing in their route a certain fixed time and track, like birds of passage. When they go upon this expedition, they are seen in great droves, for many days together, making towards the north, taking that part of the sea most free from ice, and going still forward into those seas where man cannot follow. In what manner they return, or by what passage, is utterly unknown ; it is only observed, that when they leave the coasts to go upon this expedition, they are all extremely fat, but on their return they come home excessively lean.

The females, in our climate, bring forth in winter, and rear their young upon some sand-bank, rock, or desolate island, at some distance from the continent. When they suckle their young they sit up on their hinder-legs, while these, which are at first white, with woolly hair, cling to the teats, of which there are four in number, near the navel.² In this manner the young continue in the place where they are brought forth, for twelve or fifteen days ; after which the dam brings them down to the water and accustoms them to swim and get their food by their own industry. As each litter never exceeds above three or four, so the animal's cares are not much divided, and the education of her little ones is soon completed. In fact, the young are particularly docile ; they understand the mother's voice among the numerous bleatings of the rest of the old ones ; they mutually assist each other in danger, and are perfectly obedient to her call.

¹ Krantz, vol. i. p. 129

² *Coeunt in littore resupinata femina.* LIN. SYST.

Thus early accustomed to subjection, they continue to live in society, hunt and herd together, and have a variety of tones by which they encourage to pursue, or warn each other of danger. Some compare their voices to the bleating of a flock of sheep, interrupted now and then by the barking of angry dogs, and sometimes the shriller notes of a cat. All along the shore, each has its own peculiar rock, of which it takes possession, and where it sleeps when fatigued with fishing, uninterrupted by any of the rest. The only season when their social spirit seems to forsake them, is that when they feel the influences of natural desire. They then fight most desperately, and the male that is victorious keeps all the females to himself. Their combats, on these occasions, are managed with great obstinacy, and yet great justice: two are never seen to fall upon one together; but each has its antagonist, and all fight an equal battle, till one alone becomes victorious.

We are not certainly informed how long the females continue pregnant; but if we may judge from the time which intervenes between their departure from the Greenland coasts and their return, they cannot go above seven or eight months at the farthest. How long this animal lives is also unknown: a gentleman, whom I knew in Ireland, kept two of them, which he had taken very young, in his house for ten years; and they appeared to have the marks of age at the time I saw them, for they were grown gray about the muzzle; and it is very probable they did not live many years longer. In their natural state the old ones are seen very fat and torpid, separated from the rest, and, as it should seem, incapable of procreation.

As their chief food is fish, so they are very expert at pursuing and catching it. In those places where the herrings are seen in shoals, the seals frequent and destroy them by thousands. When the herring retires, the seal is then obliged to hunt after fish that are stronger and more capable of evading the pursuit: however, they are very swift in deep waters, dive with great rapidity, and, while the spectator eyes the spot at which they disappear, they are seen to emerge at above a hundred yards distance. The weaker fishes, therefore, have no other means to escape their tyranny, but by darting into the shallows. The seal has been seen to pursue a mullet, which is a swift swimmer, and to turn it to and fro in deep water, as a hound does a hare on land. The

mullet has been seen trying every art of evasion ; and at last swimming into shallow water, in hopes of escaping. There, however, the seal followed ; so that the little animal had no other way left to escape, but to throw itself on one side, by which means it darted into shoaler water than it could have swam in with the belly undermost ; and thus at last it got free.

As they are thus the tyrants of the element in which they chiefly reside, so they are not very fearful even upon land, except on those shores which are thickly inhabited, and from whence they have been frequently pursued. Along the desert coasts, where they are seldom interrupted by man, they seem to be very bold and courageous ; if attacked with stones, like dogs, they bite such as are thrown against them ; if encountered more closely, they make a desperate resistance, and, while they have any life, attempt to annoy their enemy. Some have been known, even while they were skinning, to turn round and seize their butchers ; but they are generally despatched by a stunning blow on the nose. They usually sleep soundly when not frequently disturbed ; and that is the time when the hunters surprise them. The Europeans who go into the Greenland seas upon the whale fishery, surround them with nets, and knock them on the head ; but the Greenlanders, who are unprovided with so expensive an apparatus, destroy them in a different manner. One of these little men paddles away in his boat, and when he sees a seal asleep on the side of a rock, darts his lance, and that with such unerring aim, that it never fails to bury its point in the animal's side. The seal, feeling itself wounded, instantly plunges from the top of the rock, lance and all, into the sea, and dives to the bottom ; but the lance has a bladder tied to one end, which keeps buoyant, and resists the animal's descent ; so that every time the seal rises to the top of the water the Greenlanders strike it with his oar, until he at last despatches it. But, in our climate, the seals are much more wary, and seldom suffer the hunters to come near them. They are often seen upon the rocks of the Cornish coast, basking in the sun, or upon the inaccessible cliffs left dry by the tide. There they continue, extremely watchful, and never sleep long without moving ; seldom longer than a minute ; for then they raise their heads, and if they see no danger, they lie down again, raising and reclining their heads alternately, at intervals of about a minute each. The only method, therefore,

that can be taken, is to shoot them : if they chance to escape, they hasten towards the deep, flinging stones and dirt behind them as they scramble along, and at the same time expressing their pain, or their fears, by the most distressful cry ; if they happen to be overtaken, they make a vigorous resistance with their feet and teeth, till they are killed.

The seal is taken for the sake of its skin, and for the oil its fat yields. The former sells for about four shillings ; and, when dressed, is very useful in covering trunks, making waistcoats, shot-pouches, and several other conveniences. The flesh of this animal formerly found place at the tables of the great. At a feast provided by Archbishop Neville, for Edward the Fourth, there were twelve seals and porpoises provided, among other extraordinary rarities.

As a variety of this animal, we may mention the SEA-LION, described in Anson's Voyages. This is much larger than any of the former ; being from eleven to eighteen feet long. It is so fat, that when the skin is taken off, the blubber lies a foot thick all round the body. It seems to differ from the ordinary seal, not only in its size, but also in its food ; for it is often seen to graze along the shore, and to feed upon the long grass that grows up along the edges of brooks. Its cry is very various, sometimes resembling the neighing of a horse, and sometimes the grunting of a hog. It may be regarded as the largest of the seal family.

THE MORSE.

THE Morse is an animal of the seal kind ; but differing from the rest, in a very particular formation of the teeth, having two large tusks growing from the upper jaw, shaped like those of an elephant, but directed downwards ; whereas, in the elephant they grow upright, like horns ; it also wants the cutting teeth, both above and below : as to the rest, it pretty much resembles a seal, except that it is much larger, being from twelve to sixteen feet long. The morses are also generally seen to frequent the same places that seals are known to reside in ; they have the same habitudes, the same advantages, and the same imperfections. There are, however, fewer varieties of the morse than the seal ; and they are rarely found, except in the frozen regions near the

pole. They were formerly more numerous than at present ; and the savage natives of the coasts of Greenland destroyed them in much greater quantities, before those seas were visited by European ships upon the whale-fishery, than now. Whether these animals have been since actually thinned by the fishers, or have removed to some more distant and unfrequented shores, is not known ; but certain it is, that the Greenlanders, who once had plenty, are now obliged to toil more assiduously for subsistence ; and as the quantity of their provisions decrease, for they live mostly upon seals, the numbers of that poor people are every day diminishing. As to the teeth, they are generally from two to three feet long ; and the ivory is much more esteemed than that of the elephant, being whiter and harder. The fishers have been known formerly to kill three or four hundred at once ; and along those shores where they chiefly frequented, their bones are still seen lying in prodigious quantities. In this manner a supply of provisions, which would have supported the Greenland nation for ages, has been, in a few years, sacrificed to those who did not use them, but who sought them for the purposes of avarice and luxury !

THE MANATI.

WE come, in the last place, to an animal that terminates the boundary between quadrupeds and fishes. Instead of a creature preying among the deeps, and retiring upon land for repose or refreshment, we have here an animal that never leaves the water, and is enabled to live only there. It cannot be called a quadruped, as it has but two legs only ; nor can it be called a fish, as it is covered with hair. In short, it forms the link that unites those two great tribes to each other ; and may be indiscriminately called the last of beasts, or the first of fishes.

We have seen the seal approaching nearly to the aquatic tribes, by having its hind legs thrown back on each side of the tail, and forming something that resembled the tail of a fish ; but upon examining the skeleton of that animal, its title to the rank of a quadruped was observed plainly to appear, having all the bones of the hinder legs and feet as complete as any other animal whatsoever.

But we are now come to a creature that not only wants the

external appearance of hinder legs, but, when examined internally, will be found to want them altogether. The Manati is somewhat shaped in the head and the body like a seal; it has also the fore legs or hands pretty much in the same manner, short and webbed, but with four claws only; these also are shorter in proportion than in the former animal, and placed nearer the head; so that it can scarcely assist its motions upon land. But it is in the hinder parts that it chiefly differs from all others of the seal kind; for the tail is perfectly that of a fish, being spread out broad like a fan, and wanting even the vestiges of those bones which make the legs and feet in others of its kind. The largest of these are about twenty-six feet in length; the skin is blackish, very tough and hard; when cut as black as ebony; and there are a few hairs scattered, like bristles, of about an inch long. The eyes are very small, in proportion to the animal's head; and the ear-holes, for it has no external ears, are so narrow as scarcely to admit a pin's head. The tongue is so short, that some have pretended it has none at all; and the teeth are composed only of two solid white bones, running the whole length of both jaws, and formed merely for chewing, and not tearing its vegetable food. The female has breasts placed forward, like those of a woman; and she brings forth but one at a time: this she holds with her paws to her bosom; there it sticks, and accompanies her wherever she goes.

This animal can scarcely be called amphibious, as it never entirely leaves the water, only advancing the head out of the stream to reach the grass on the river sides. Its food is entirely upon vegetables; and, therefore, it is never found far in the open sea, but chiefly in the large rivers of South America; and often above two thousand miles from the ocean. It is also found in the seas near Kamtschatka, and feeds upon the weeds that grow near the shore. There are likewise level greens at the bottom of some of the Indian bays, and there the manaties are harmlessly seen grazing among turtles and other crustaceous fishes, neither giving nor fearing any disturbance. These animals, when unmolested, keep together in large companies, and surround their young ones.¹ They bring forth most commonly in autumn; and it is supposed they go with young eighteen months, for the time of generation is in spring.

¹ Acta Petropolitana.

The manati has no voice nor cry, for the only noise it makes is by fetching its breath. Its internal parts somewhat resemble those of a horse; its intestines being longer, in proportion, than those of any other creature, the horse only excepted.

The fat of the manati, which lies under the skin, when exposed to the sun, has a fine smell and taste, and far exceeds the fat of any sea animal; it has this peculiar property, that the heat of the sun will not spoil it, nor make it grow rancid; its taste is like the oil of sweet almonds; and it will serve very well, in all cases, instead of butter: any quantity may be taken inwardly with safety, for it has no other effect than keeping the body open. The fat of the tail is of a harder consistence; and, when boiled, is more delicate than the former. The lean is like beef, but more red; and may be kept a long while, in the hottest days, without tainting. It takes up a long time in boiling; and, when done, eats like beef. The fat of the young ones is like pork; the lean is like veal; and, upon the whole, it is very probable that this animal's flesh somewhat resembles that of turtle; since they are fed in the same element, and upon the very same food. The turtle is a delicacy well known among us: our luxuries are not as yet sufficiently heightened to introduce the manati; which if it could be brought over, might singly suffice for a whole corporation!*

* To those amphibious quadrupeds may be added the DUCK-BILLED PLATYPUS, or Ornithorynchus, described by Dr Shaw in his Naturalist's Miscellany. The body is depressed, and has some resemblance to that of an otter in miniature; and is covered with a soft beaver-like fur: but its most striking peculiarity is the strange situation of its mouth or snout, exhibiting the perfect resemblance of the beak of a duck engrafted on the head of a quadruped; and so accurate is the "imitation, that at first view it naturally excites the idea of some deceptive preparation by artificial means. These animals have hitherto been found only in the rivers of New Holland. They are expert swimmers, and seldom quit the water. On shore they crawl rather than walk, occasioned by the shortness of the limbs and comparative length of the body. They probably live on worms and aquatic insects.

BOOK VII.

OF THE MONKEY KIND,—THE ELEPHANT, RHINOCEROS, ETC.

CHAP. I.

ANIMALS OF THE MONKEY KIND.*

QUADRUPEDS may be considered as a numerous group, terminated on every side by some that but in part deserve the name.

* Monkeys form by far the greatest portion of the *Quadrumanæ*; all the other animals of that order being comprehended, or rather confounded in a distinct family under the name of Lemurs, from the rightful owners of which appellation many of them differ most essentially. In addition to the hands on the posterior as well as anterior members, with long and flexible fingers and opposable thumbs, which constitute the primary characters of the order, the monkey tribe in general is distinguished by the following peculiarities. Their incisor teeth are invariably four in each jaw, and their molars like those of man are flat and surmounted by blunted tubercles. The latter are five in number on each side of either jaw, in all the monkeys of the Old Continent, and in one very distinct tribe belonging to the New; but most of the American species are furnished with a sixth. Their canines vary considerably in size, from a trifling projection beyond the remaining teeth to a long and powerful tusk, almost equalling those of the most formidable carnivora; and from this structure it necessarily follows that a vacant space is left between the incisors and the canines of the upper jaw, and between the canines and the molars of the lower, for the reception and lodgment of those organs when the mouth is closed. The nails of all their fingers, as well as those of the thumbs, are invariably flat and expanded.

In almost every other point they are subject to infinite variations of form and structure. The shape of the head, which, in one or two species, offers a close approximation to the human form, passes through numerous intermediate gradations, until it reaches a point at which it can only be compared with that of the hound. The body, which is in general slight and well made, is in some few instances remarkably short and thickset, and in others drawn out to a surprising degree of tenuity. Their limbs vary greatly in their proportions; but in most of them the anterior are longer than the posterior: in all they are admirably adapted to the purposes to which they are applied, in climbing and leaping by the slenderness of their form, the flexibility of their joints, and the muscular activity with which these qualities are so

On one quarter we see a tribe covered with quills, or furnished with wings, that lift them among the inhabitants of the air ; on another, we behold a diversity clothed with scales and shells, to rank with insects ; and still on a third, we see them descending

strikingly combined. But of all their organs there is perhaps none which exhibits so remarkable a discrepancy in every particular as the tail ; which is entirely wanting in some, forms a mere tubercle in others, in a third group is short and tapering, in a fourth of moderate length and cylindrical, in a fifth extremely long, but uniformly covered with hair ; in others, again, of equal length, divested of hair beneath and near the tip, and capable of being twisted round the branch of a tree or any other similar substance in such a manner as to support the whole weight of the animal, even without the assistance of his hands.

In none of them, it may be observed, are the hands formed for swimming, or the nails constructed for digging the earth ; and in none of them is the naked callous portion, which corresponds to the sole or the palm, capable of being applied, like the feet of man or of the bear, to the flat surfaces on which they may occasionally tread. Even in those which have the greatest propensity to assume an upright posture, the body is, under such circumstances, wholly supported by the outer margins of the posterior hands. The earth, in fact, is not their proper place of abode ; they are essentially inhabitants of trees, and every part of their organization is admirably fitted for the mode of life to which they were destined by the hand of nature herself. Throughout the vast forests of Asia, Africa, and South America, and more especially in those portions of the three continents which are comprehended within the tropics, they congregate in numerous troops, bounding rapidly from branch to branch, and from tree to tree, in search of the fruits and eggs which constitute their principal means of subsistence. In the course of these peregrinations, which are frequently executed with a velocity scarcely to be followed by the eye, they seem to give a momentary, and but a momentary, attention to every remarkable object that falls in their way, but never appear to remember it again ; for they will examine the same object with the same rapidity as often as it recurs, and apparently without in the least recognizing it as that which they had seen before. They pass on a sudden from a state of seeming tranquillity to the most violent demonstrations of passion and sensuality ; and in the course of a few minutes run through all the various phases of gesture and action of which they are capable, and for which their peculiar conformation affords ample scope. The females treat their young with the greatest tenderness until they become capable of shifting for themselves ; when they turn them loose upon the world, and conduct themselves towards them from that time forwards in the same manner as towards the most perfect strangers.

The degrees of their so much vaunted intelligence, which is in general very limited, and rarely capable of being made subservient to the purposes of man, vary almost as much as the ever-changing outline of their form. From the grave and reflective *oran-otang*, whose docility and powers of imitation in his young state have been the theme of so much ridiculous exaggeration and sophistical argumentation, to the stupid and savage baboon, whose gross brutality is scarcely relieved by a single spark of intelligence,

into the waters, to live among the mute tenants of that element. We now come to a numerous tribe, that leaving the brute creation, seem to make approaches even to humanity; that bear an awkward resemblance of the human form, and discover some faint efforts at intellectual sagacity.

the gradations are regular and easy. A remarkable circumstance connected with the development of this faculty, or perhaps we should rather say, with its gradual extinction, consists in the fact that it is only in young animals which have not yet attained their full growth, that it is capable of being brought into play; the older individuals, even of the most tractable races, entirely losing the gaiety, and with it the docility, of their youth, and becoming at length as stupid and as savage as the most barbarous of the tribe.

The monkeys of the Old and of the New World differ from each other in several remarkable points, some of which are universally characteristic of all the species of each, while others, although affording good and tangible means of discrimination, are but partially applicable. Thus the nostrils of all the species inhabiting the Old World are anterior, like those of man, and divided only by a narrow septum. In those of the New World, on the contrary, they are invariably separated by a broad division, and consequently occupy a position more or less lateral. In the former again the molar teeth are uniformly five in number, crowned with obtuse and flattened tubercles; while in the latter they are either six in number, or in the few anomalous cases in which they are limited to five, and which are peculiar to a groupe that ought to occupy an intermediate station between the monkeys and the Insect-eating Carnivora, their crowns are surmounted by sharp and somewhat elevated points. The tails of all the American monkeys are of great length, but they differ more or less from each other in the power of suspending themselves by means of that organ, a faculty which is nevertheless common to the greater number of them, and of which those of the Old World are entirely destitute. On the other hand the American species never exhibit any traces of the callosities or of the cheek-pouches, which are so common among the Asiatic and African races.

Each of these grand divisions has been subdivided into several minor groups or genera; but zoologists have hitherto been by no means unanimous with respect to the principles on which this subdivision ought to be effected. The arrangement which appears to be most generally adopted at the present day is that of M. Cuvier and M. Geoffroy-Saint-Hilaire, which is essentially founded on the application of an imaginary rule, first employed by Camper for ascertaining the degree of intelligence, and consequently of ideal beauty, expressed by the human face in its various gradations of elevation or debasement, and called by him the facial angle. Unfortunately, however, the operations of nature in the animal creation can never be subjected to geometrical laws; nor can her innumerable phases be expressed with the precision of a mathematical theorem. This assumed point of comparison varies almost indefinitely not merely in different species, but even in the same individual; and the *oran-otang* himself, who is supposed to approach most nearly to the human form, offers the most striking illustration of the truth of this observation; inasmuch as in his young and intellectual state his facial angle is equal to 65° , while in his aged and

Animals of the Monkey class are furnished with hands instead of paws; their ears, eyes, eye-lids, lips, and breasts, are like those of mankind; their internal conformation also bears some distant likeness; and the whole offers a picture that may well mortify the pride of such as make their persons alone the principal object of their admiration. These approaches, however, are gradual; and some bear the marks of this our boasted form more strongly than others.

In the Ape kind we see the whole external machine strongly impressed with the human likeness, and capable of the same exertions: these walk upright, want a tail, have fleshy posteriors, have calves to their legs, and feet nearly like ours.

In the Baboon kind we perceive a more distant approach to the human form; the quadruped mixing in every part of the animal's figure: these generally go upon all fours; but some, when upright, are as tall as a man; they have short tails, long snouts, and are possessed of brutal fierceness.

The Monkey kind are removed a step further; these are much less than the former, with tails as long, or longer, than their bodies, and flatish faces.

Lastly, the Maki and Oppossum kind, seem to lose all resemblance of the human figure, except in having hands; their noses are lengthened out like those of quadrupeds, and every part of their bodies totally different from the human; however, as they grasp their food, or other objects, with one hand, which quadrupeds cannot do, this single similitude gives them an air of sagacity, to which they have scarcely any other pretensions.

debased condition, in which he has actually been repeatedly described as a different animal under the name of Pongo, it sinks below 300; degrading him even beneath the level of the most savage and stupid of the baboons.

In the foregoing observations we may be perhaps considered as giving too much space to the generalities of the subject; an objection to which we can only answer that nearly the whole of our knowledge of the monkey tribes consists in generalities. Of the great number of species, upwards of one hundred which are now known and characterized, very few are distinguished from their immediate fellows by striking and strongly-marked characters, either physical or moral. The groupes too are connected by such gradual and easy transitions, that although the typical forms of each, isolated from the mass and placed in contrast with each other, unquestionably exhibit many broadly distinguishing peculiarities, yet the entire series offers a chain so nearly complete and unbroken as scarcely to admit of being treated of in any other way than as one homogeneous whole.

From this slight survey it may be easily seen that one general description will not serve for animals so very different from each other: nevertheless, it will be fatiguing to the last degree, as their varieties are so numerous, and their differences so small, to go through a particular description of each. In this case it will be best to give a history of the foremost in each class; at the same time marking the distinctions in every species. By this we shall avoid a tedious repetition of similar characters, and consider the manners and the oddities of this fantastic tribe in general points of view; where we shall perceive how nearly they approach to the human figure, and how little they benefit by the approximation. The foremost of the ape kind is

THE ORAN-OUTANG, OR WILD MAN OF THE WOODS.

THIS name seems to have been given to various animals, agreeing in one common character of walking upright, but coming from different countries, and of very different proportions and powers. The TROGLODYTE of Bontius, the DRILL of Purchas, and the PYGMY of Tyson, have all received this general name: and have been ranked, by some naturalists, under one general description.* If we read the accounts of many remote travellers, under this name we are presented with a formidable animal, from six to eight feet high; if we examine the books of such as have described it nearer home, we find it a pigmy not above three. In this diversity we must be content to blend their various descriptions into one general account; observing, at the

* The Troglodyte, or Chimpanse, is a distinct animal from the Oran-Outang. The Chimpanse seldom measures more than from two feet and a half to three feet in height; and its hair is dark brown, or blackish. Its head is conic, the body brawny, the back and shoulders are hairy, and the rest of the body smooth.

Two Champanses were sent from the forests of the Carnatic by a coasting vessel, as a present to the Governor of Bombay. They, like the rest of the species, had many human actions, and seemed, by their melancholy, to have a rational sense of their captivity. They were scarcely two feet high, but walked erect, and very nearly resembled the human form. The female was taken ill during the voyage, and died; and the male, exhibiting every demonstration of grief, refused to eat, and lived only two days afterwards.

Both in face and form, the Chimpanse has a closer approximation to humanity than the Oran-Outang. Its habitat is confined to intertropical Africa—that of the Oran-Outang is Asiatic.

same time, that we have no reason to doubt any of their relations, although we are puzzled which to follow.

The Oran-Outang, which of all other animals most nearly approaches to the human race, is seen of different sizes, from three to seven feet high. In general, however, its stature is less than that of a man; but its strength and agility much greater. Travellers, who have seen various kinds of these animals in their native solitudes, give us surprising relations of their force, their swiftness, their address, and their ferocity. Naturalists, who have observed their form and manners at home, have been as much struck with their patient, pliant, imitative dispositions; with their appearance and conformation, so nearly human. Of the smallest sort of these animals we have had several, at different times, brought into this country, all nearly alike: but that observed by Dr Tyson is the best known, having been described with the greatest exactness.*

* Naturalists are now inclined to suspect that what has hitherto been described in Europe as the Oran-Outang is in fact, a young *Pongo*—an ape of great strength and size. The most recent and most remarkable capture of the Pongo or great oran-outang is recorded by Dr Clarke Abel, in the fifteenth volume of the Asiatic Researches.

Dr Clarke Abel's attention was originally directed to the subject by the following notice in the *Hurkara Newspaper*, communicated to that journal by one of the individuals concerned in the onslaught.

‘A party having landed on the north coast of Sumatra, from the Mary-Anne Sophia, Captain Cornfoot, for the purpose of watering, fell in with an animal of the monkey species of a most gigantic size. It was upwards of seven feet in height; and, after receiving seven shots, was killed. After the fifth shot, it climbed a tree, and reclined against its boughs, to all appearance in great pain, and vomited a considerable quantity of blood. Its lower jaw, and the skin of the back and arms, which are brought round to Calcutta, I have seen. Some of the teeth of the upper jaw have also arrived here, and are about to be deposited in the museum of the Asiatic Society. There are some of them about three inches long. The lower jaw is immense: and the skin, to which I have before referred, is so large, that, although cut off from the wrists, each arm is now considerably longer than mine, and I am a man not a quarter of an inch under six feet. The back is remarkably broad, and is covered with long coarse brown hair. When the animal made its appearance, it seemed as if it had come from some distance; and to all appearance it had been walking through a swamp, its legs, up to the knees, being muddy. Its gait was slovenly, and as it went it waddled from side to side.’

Dr Abel adds the following additional information, obtained through direct oral communication with Captain Cornfoot. ‘This formidable animal was more than a head taller than the tallest man on board, even in an ordin-

The animal which was described by that learned physician, was brought from Angola, in Africa, where it had been taken in the internal parts of the country, in company with a female of the same kind, that died by the way. The body was covered

ary standing posture, and it measured eight feet in height when suspended for the purpose of being skinned. The form and arrangement of its beard were beautiful; there was a great deal of the human expression in its countenance, and its piteous actions when wounded, and great tenacity of life, rendered the scene tragical and affecting. On the spot where he was killed, there were five or six tall trees which greatly prolonged the combat; for so great was his strength and agility in bounding from branch to branch, that his pursuers were unable to take a determinate aim, until they had felled all the trees but one. Even then he did not yield himself to his antagonists till he had received five balls, and been moreover thrust through with a spear. One of the first balls appears to have penetrated his lungs, for he was observed immediately to sling himself by his feet from a branch, with his head downwards, so as to allow the blood to flow from his mouth. On receiving a wound, he always put his hand over the injured part, and distressed his pursuers by the human-like agony of his expression. When on the ground, after being exhausted by his many wounds, he lay as if dead, with his head resting on his folded arms. It was at this moment that an officer attempted to give him the *coup-de-grace* by pushing a spear through his body, but he immediately jumped on his feet, wrested the weapon from his antagonist, and shivered it in pieces. This was his last wound, and his last great exertion; yet he lived some time afterwards, and drank, it is stated, great quantities of water. Captain Cornfoot also observes, that the animal had probably travelled some distance to the place where he was killed, as his legs were covered with mud up to the knees.'

The countenance of this tremendous creature, with the exception of the beard, was nearly bare, a few short downy hairs being alone scattered over it. It was of a dark lead colour, excepting the margins of the lips, which were paler. The eyes were small, in relation to those of man, and about an inch apart. The eyelids were well fringed with lashes. The ears were comparatively very small, being not more than an inch and a half long, and barely an inch in breadth. They lay close to the head, and resembled those of the human race, with the exception of the lower lobe, which was wanting. The nose scarcely rose above the level of the face, and the nostrils were three-fourths of an inch in breadth, and were placed obliquely side by side. The muzzle was projecting, and the opening of the mouth very large. The lips appeared narrow when closed, but were, in reality, half an inch in thickness. The hair of the head was of a reddish brown colour; it grew from behind forwards, and measured five inches in length. The beard was handsome, and appeared to have been curly during the lifetime of the animal. Its colour was lighter than the hair of the head, and approached a light chestnut. The beard was about three inches long, and sprung very gracefully from the upper lip, near the angles of the mouth, in the form of mustachios, from whence descending, it clothed the chin.

The palms of the hands were of great length, and naked from the wrists. Their backs were covered with hair, which was sparse upon the fingers.

with hair, which was of a coal black colour, more resembling human hair than that of brutes. It bore a still stronger similitude in its different lengths ; for in those places where it is longest on the human species it was also longest in this ; as on the head, the upper lip, the chin, and the pubes. The face was like that of a man, the forehead larger, and the head round. The upper and lower jaw were not so prominent as in monkeys ; but flat, like those of a man. The ears were like those of a man, in most respects ; and the teeth had more resemblance to the human than those of any other creature. The bending of the arms and legs was just the same as in a man ; and, in short, the animal at first view, presented a figure entirely human.

In order to discover its differences, it was necessary to take a closer survey ; and then the imperfections of its form began to appear. The first obvious difference was in the flatness of the nose ; the next in the lowness of the forehead, and the wanting the prominence of the chin. The ears were proportionably too large ; the eyes too close to each other ; and the interval between the nose and mouth too great. The body and limbs differed, in the thighs being too short, and the arms too long ; in the thumb being too little, and the palm of the hand too narrow. The feet also were rather more like hands than feet ; and the animal, if we may judge from the figure, bent too much upon its haunches.

When this creature was examined anatomically, a surprising similitude was seen to prevail in its internal conformation. It differed from man in the number of its ribs, having thirteen ;

This hair inclined backwards towards the wrists, and then turned directly upwards. All the fingers were terminated by strong, black, convex nails. The thumb reached to the first joint of the forefinger. The soles of the feet were bare ; the feet were covered on the back with long brown hair, as far as the last joint of the toes. The great toe was set on nearly at right angles to the foot, and was relatively very short. The general colour of the skin of this animal was a dark lead. The hair was of a brownish red, varying in some places to a blackish hue, but appearing red under a stronger light. It was on all parts very long, directed upwards on the fore arm, but from the upper arm it hung down loose and shaggy. It was equally long and full upon the flanks, but was more scantily spread over the chest and fore part of the body. The extended arms of this woodland giant were capable of embracing a span of eight feet two inches. His height, according to the measurements of Dr Abel, may have exceeded, but could not have been less than, seven feet six inches and a half.

whereas, in man, there are but twelve. The vertebræ of the neck also were shorter, the bones of the pelvis narrower, the orbits of the eyes were deeper, the kidneys were rounder, the urinary and gall-bladders were longer and smaller, and the ureters of a different figure. Such were the principal distinctions between the internal parts of this animal and those of man; in almost every thing else they were entirely and exactly the same, and discovered an astonishing congruity. Indeed, many parts were so much alike in conformation that it might have excited wonder how they were productive of such few advantages. The tongue, and all the organs of the voice, were the same, and yet the animal was dumb; the brain was formed in the same manner with that of man, and yet the creature wanted reason: an evident proof (as Mr Buffon finely observes) that no dispositions of matter will give mind; and that the body, how nicely soever formed, is formed in vain, when there is not infused a soul to direct its operations.

Having thus taken a comparative view of this creature with man, what follows may be necessary to complete the general description. This animal was very hairy all behind, from the head downwards; and the hair so thick that it covered the skin almost from being seen: but in all parts before, the hair was much thinner, the skin everywhere appeared, and in some places it was almost bare. When it went on all-fours, as it was sometimes seen to do, it appeared all hairy; when it went erect it appeared before less hairy, and more like a man. Its hair, which in this particular animal was black, much more resembled that of men than the fur of brutes; for, in the latter, besides their long hair, there is usually a finer and a shorter intermixed; but in the oran-outang it was all of a kind; only about the pubes the hair was grayish, seemed longer, and somewhat different; as also on the upper lip and chin, where it was grayish like the hair of a beard. The face, hands, and soles of the feet, were without hair; and so was most part of the forehead: but down the sides of the face the hair was thick, it being there about an inch and a half long, which exceeded that on any other part of the body. In the palms of its hands were remarkable those lines which are usually taken notice of in palmistry; and, at the tips of the fingers, those spiral lines observed in man. The palms of the hands were as long as the soles of the feet;

and the toes upon these were as long as the fingers ; the middle toe was the longest of all, and the whole foot differed from the human. The hinder feet being thus formed as hands, the animal often used them as such ; and, on the contrary, now and then made use of its hands instead of feet. The breasts appeared small and shrivelled, but exactly like those of a man : the navel also appeared very fair, and in exact dispositions, being neither harder nor more prominent than what is usually seen in children. Such is the description of this extraordinary creature ; to which little has been added by succeeding observers, except that the colour of the hair is often found to vary ; in that described by Edwards it was of a reddish brown.

From a picture so like that of the human species, we are naturally led to expect a corresponding mind ; and it is certain, that such of these animals as have been shown in Europe, have discovered a degree of imitation beyond what any quadruped can arrive at.

That of Tyson was a gentle, fond, harmless creature. In its passage to England, those that it knew on ship-board it would embrace with the greatest tenderness, opening their bosoms, and clasping its hands about them. Monkeys of a lower species it held in utter aversion ; it would always avoid the place where they were kept in the same vessel ; and seemed to consider itself as a creature of higher extraction. After it was taken, and a little used to wear clothes, it grew very fond of them ; a part it would put on without any help, and the rest it would carry in its hands to some of the company, for their assistance. It would lie in a bed, place its head on the pillow, and pull the clothes upwards as a man would do.

That which was seen by Edwards, and described by Buffon, showed even a superior degree of sagacity. It walked, like all of its kind, upon two legs, even though it carried burdens. Its air was melancholy, and its deportment grave. Unlike the baboon or monkey, whose motions are violent, and appetites capricious, who are fond of mischief, and obedient only from fear, this animal was slow in its motions, and a look was sufficient to keep it in awe. I have seen it, says Mr Buffon, give its hand to show the company to the door : I have seen it sit at table, unfold its napkin, wipe its lips, make use of the spoon and the fork to carry the victuals to its mouth, pour out its drink into a glass,

touch glasses when invited, take a cup and saucer and lay them on the table, put in sugar, pour out its tea, leave it to cool before drinking, and all this without any other instigation than the signs or the command of its master, and often of his own accord. It was gentle and inoffensive ; it even approaches strangers with respect, and came rather to receive caresses than to offer injuries. It was particularly fond of sugared comfits, which every body was ready to give it ; and as it had a defluxion upon the breast, so much sugar contributed to increase the disorder, and shorten its life. It continued at Paris but one summer, and died in London. It ate indiscriminately of all things, but it preferred dry and ripe fruits to all other aliments. It would drink wine, but in small quantities, and gladly left it for milk, tea, or any other sweet liquor.*

* Dr Clark Abel has given the following interesting account of an orang-utang which he brought from Java to England. "On board ship an attempt being made to secure him by a chain tied to a strong staple, he instantly unfastened it, and ran off with the chain dragging behind ; but finding himself embarrassed by its length, he coiled it once or twice, and threw it over his shoulder. This feat he often repeated ; and when he found that it would not remain on his shoulder, he took it into his mouth. After several abortive attempts to secure him more effectually, he was allowed to wander freely about the ship, and soon became familiar with the sailors, and surpassed them in agility. They often chased him about the rigging, and gave him frequent opportunities of displaying his adroitness in managing an escape. On first starting, he would endeavour to outstrip his pursuers by mere speed ; but when much pressed, eluded them by seizing a loose rope, and swinging out of their reach. At other times, he would patiently wait on the shrouds or at the mast-head, till his pursuers almost touched him, and then suddenly lower himself to the deck by any rope that was near him, or bound along the main-stay from one mast to the other, swinging by his hands, and moving them one over the other. The men would often shake the ropes by which he clung with so much violence, as to make me fear his falling ; but I soon found that the power of his muscles could not be easily overcome. When in a playful humour, he would often swing within arm's length of his pursuer, and, having struck him with his hand, throw himself from him.

"Whilst in Java he lodged in a large tamarind-tree near my dwelling, and formed a bed by intertwining the small branches, and covering them with leaves. During the day, he would lie with his head projecting beyond his nest, watching whoever might pass under ; and when he saw any one with fruit, would descend to obtain a share of it. He always retired for the night at sunset, or sooner if he had been well fed, and rose with the sun, and visited those from whom he habitually received food.

"Of some small monkeys on board from Java he took little notice, whilst under the observation of the persons of the ship. Once, indeed, he opened attempted to throw a small cage, containing three of them, overboard ; be-

Such these animals appeared when brought into Europe. However, many of their extraordinary habits were probably the result of education, and we are not told how long the instructions they received for this purpose were continued. But we learn

cause, probably, he had seen them receive food, of which he could obtain no part. But although he held so little intercourse with them when under our inspection, I had reason to suspect, that he was less indifferent to their society when free from our observation; and was one day summoned to the top-gallant-yard of the mizen-mast to overlook him playing with a young male monkey. Lying on his back, partially covered with a sail, he for some time contemplated, with great gravity, the gambols of the monkey, which bounded over him: but at length caught him by the tail, and tried to envelope him in his covering. The monkey seemed to dislike his confinement, and broke from him, but again renewed its gambols, and although frequently caught, always escaped. The intercourse, however, did not seem to be that of equals, for the oran outang never condescended to romp with the monkey, as he did with the boys of the ship. Yet the monkeys had evidently a great predilection for his company; for whenever they broke loose, they took their way to his resting-place, and were often seen lurking about it, or creeping clandestinely towards him. There appeared to be no gradation in their intimacy: as they appeared as confidently familiar with him when first observed, as at the close of their acquaintance.

"But although so gentle when not exceedingly irritated, the oran outang could be excited to violent rage, which he expressed by opening his mouth, showing his teeth, and seizing and biting those who were near him. Sometimes, indeed, he seemed almost driven to desperation: and, on two or three occasions, committed an act, which in a rational being, would have been called the threatening of suicide. If repeatedly refused an orange when he attempted to take it, he would shriek violently, and swing furiously about the ropes; then return and endeavour to obtain it: if again refused, he would roll for some time like an angry child upon the deck, uttering the most piercing screams; and then suddenly starting up, rush furiously over the side of the ship and disappear. On first witnessing this act, we thought that he had thrown himself into the sea; but, on a search being made, found him concealed under the chains.

"This animal neither practises the grimaces and antics of other monkeys, nor possesses their perpetual proneness to mischief. Gravity, approaching to melancholy, and mildness, were sometimes strongly expressed in his countenance, and seem to be the characteristics of his disposition. When he first came among strangers, he would sit for hours with his hand upon his head, looking pensively at all around him; and when much incommoded by their examination, would hide himself beneath any covering that was at hand. His mildness was evinced by his forbearance under injuries, which were grievous before he was excited to revenge: but he always avoided those who often teased him. He soon became strongly attached to those who kindly used him. By their side he was fond of sitting; and getting as close as possible to their persons, would take their hands between his lips, and fly to them for protection. From the boatswain of the *Alceste*, who shared his meals with him, and was his chief favourite, although he some-

from another account that they take but a very short time to come to a great degree of imitative perfection. Mr L. Brosse bought two young ones, that were but a year old, from a negro ; and these at that early age discovered an astonishing power of

times purloined the grog and the biscuit of his benefactor, he learned to eat with a spoon ; and might be often seen sitting at his cabin door, enjoying his coffee, quite unembarrassed by those who observed him, and with a grotesque and sober air, that seemed a burlesque on human nature.

“ Next to the boatswain, I was, perhaps, his most intimate acquaintance. He would always follow me to the mast-head, where I often went for the sake of reading apart from the noise of the ship ; and, having satisfied himself that my pockets contained no eatables, would lie down by my side, and pulling a topsail entirely over him, peep from it occasionally to watch my movements.

“ His favourite amusement in Java was in swinging from the branches of trees, in passing from one to another, and in climbing over the roofs of houses ; on board, in hanging by his arms from the ropes, and in romping with the boys of the ship. He would entice them into play by striking them with his hand as they passed, and bounding from them, but allowing them to overtake him, and engage in a mock scuffle, in which he used his hands, feet, and mouth. If any conjecture could be formed from these frolics of his mode of attacking the adversary, it would appear to be his first object to throw him down, then to secure him with his hands and feet, and then wound him with his teeth.

“ On board ship he commonly slept at the mast-head, after wrapping himself in a sail. In making his bed, he used the greatest pains to remove every thing out of his way, that might render the surface on which he intended to lie uneven : and, having satisfied himself with this part of his arrangement, spread out the sail, and lying down upon it on his back, drew it over his body. Sometimes I pre-occupied his bed, and teased him by refusing to give it up. On these occasions he would endeavour to pull the sail from under me, or to force me from it, and would not rest till I had resigned it. If it were large enough for both, he would quietly lie by my side. If all the sails happened to be set, he would hunt about for some other covering, and either steal one of the sailors’ jackets or shirts that happened to be drying, or empty a hammock of its blankets. Off the Cape of Good-Hope he suffered much from a low temperature, especially early in the morning, when he would descend from the mast, shuddering with cold, and running up to any one of his friends, climb into their arms, and clasping them closely, derive warmth from their persons, screaming violently at any attempt to remove him.

“ His food in Java was chiefly fruit, especially mangostans, of which he was extremely fond. He also sucked eggs with voracity, and often employed himself in seeking them. On board ship his diet was of no definite kind. He ate readily of all kinds of meat, and especially raw meat ; was very fond of bread, but always preferred fruits, when he could obtain them.

“ His beverage in Java was water ; on board ship it was as diversified as his food. He preferred coffee and tea, but would readily take wine, and exemplified his attachment to spirits by stealing the captain’s brandy bottle. Since his arrival in London he has preferred beer and milk to any thing else, but drinks wine and other liquors.

imitation.¹ They even then sat at the table like men, ate of every thing without distinction, made use of their knife, spoon, and fork, both to eat their meat and help themselves. They drank wine and other liquors. When carried on ship-board they had

“In his attempts to obtain food, he afforded us many opportunities of judging of his sagacity and disposition. He was always very impatient to seize it when held out to him, and became passionate when it was not soon given up; and would chase a person all over the ship to obtain it. I seldom came upon deck without sweetmeats or fruit in my pocket, and could never escape his vigilant eye. Sometimes I endeavoured to evade him by ascending to the mast head, but was always overtaken or intercepted in my progress. When he came up with me on the shrouds, he would secure himself by one foot to the ratlings, and confine my legs with the other and one of his hands, while he rifled my pockets. If he found it impossible to overtake me, he would climb to a considerable height on the loose rigging, and then drop suddenly upon me. Or if, perceiving his intention, I attempted to descend, he would slide down a rope, and meet me at the bottom of the shrouds. Sometimes I fastened an orange to the end of a rope, and lowered it to the deck from the mast head; and as soon as he attempted to seize it drew it rapidly up. After being several times foiled in endeavouring to obtain it by direct means, he altered his plan. Appearing to care little about it, he would remove to some distance, and ascend the rigging very leisurely for some time, and then, by a sudden spring, catch the rope which held it. If defeated again by my suddenly jerking the rope, he would at first seem quite in despair, relinquish his effort, and rush about the rigging, screaming violently. But he would always return, and again seizing the rope, disregard the jerk, and allow it to run through his hand till within reach of the orange; but if again foiled, would come to my side, and taking me by the arm, confine it while he hauled the orange up.

“I have seen him exhibit violent alarm on two occasions only, when he appeared to seek for safety in gaining as high an elevation as possible. On seeing eight large turtles brought on board, whilst the *Cæsar* was off the Island of Ascension, he climbed with all possible speed to a higher part of the ship than he had ever before reached, and, looking down upon them, projected his long lips into the form of a hog’s snout, uttering at the same time a sound which might be described as between the croaking of a frog and the grunting of a pig. After some time he ventured to descend, but with great caution, peeping continually at the turtle, but could not be induced to approach within many yards of them. He ran to the same height, and uttered the same sounds, on seeing some men bathing and splashing in the sea; and since his arrival in England has shown nearly the same degree of fear at the sight of a live tortoise.”

This animal survived his transportation to this country from August 1817, when he arrived, to the 1st April, 1819, during which interval he was in the custody of Mr Cross at Exeter Change, as much caressed for the gentleness of his disposition as he was noticed for his great rarity. There was no need of personal confinement, and little of restraint or coercion; to his keepers especially, and to those whom he knew by their frequent visits, he

1 As quoted by Buffon, vol. xxviii. p. 77.

signs for the cabin-boys expressive of their wants ; and whenever these neglected attending upon them as they desired, they instantly flew into a passion, seized them by the arm, bit them, and kept them down. The male was sea-sick, and required attendance like a human creature ; he was twice bled in the arm, and every time afterwards, when he found himself out of order, he showed his arm, as desirous of being relieved by bleeding.

Pyrard relates, that in the province of Sierra Leona, in Africa, there are a kind of apes, called Baris, which are strong and muscular, and which, if properly instructed when young, serve as very useful domestics. They usually walk upright ; they pound at a mortar ; they go to the river to fetch water, this they carry back in a little pitcher on their heads ; but if care be not taken to receive the pitcher at their return, they let it fall to the ground, and then seeing it broken, they begin to lament and cry for their loss. Le Compté's account is much to the same purpose, of an ape which he saw in the Straits of Molucca. " It walked upon its two hind feet, which is bent a little, like a dog that had been taught to dance. It made use of its hands and arms as we do. Its visage was not much more disagreeable than that of a Hottentot ; but the body was all over covered with a woolly hair of different colours. As to the rest it cried like a child ; all its outward actions were so like the human, and the passions so lively and significant, that dumb men could scarcely better express their conceptions and desires. It had also that expression of passion or joy which we often see in children, stamping with its feet, and striking them against the ground, to show its spite, or when refused any thing it passionately longed for. " Although these animals (continues he) are very big, for that I saw was four feet high, their nimbleness is incredible. It is a pleasure beyond expression to see them run up the tackling of a ship, where they sometimes play as if they had a knack of vaulting

displayed a decided partiality. During his last illness, and at his death, his piteous appearance, which seemed to bespeak his entreaties to those about him for relief, did not fail to excite the feelings of all who witnessed them, an excitement evidently heightened by the recollection of human suffering under similar circumstances, which the sight of this animal so strongly brought to mind. He was shedding his teeth at the period of his death, which was probably promoted, if not caused by it. This was sufficient evidence of his nonage, and as he increased both in stature and general bulk during his residence here, this individual may be said to support the conjecture that the adult oran-outang is no other than the Pongo.

peculiar to themselves, or as if they had been paid, like our rope-dancers, to divert the company. Sometimes, suspended by one arm, they poise themselves, and then turn all of a sudden round about a rope, with as much quickness as a wheel, or a sling put into motion. Sometimes holding the rope successively with their long fingers, and, letting their whole body fall into the air, they run full speed from one end to the other, and come back again with the same swiftness. There is no posture but they imitate, nor motion but they perform, bending themselves like a bow, rolling like a bowl, hanging by the hands, feet, and teeth, according to the different fancies with which their capricious imagination supplies them. But what is still more amazing than all, is their agility to fling themselves from one rope to another, though at thirty, forty, and fifty feet distance."

Such are the habitudes and the powers of the smaller class of these extraordinary creatures ; but we are presented with a very different picture in those of a larger stature and more muscular form. The little animals we have been describing, which are seldom found above four feet high, seem to partake of the nature of dwarfs among the human species, being gentle, assiduous, and playful, rather fitted to amuse than terrify. But the gigantic races of the oran-outang, seen and described by travellers, are truly formidable, and in the gloomy forests, where they are only found, seem to hold undisputed dominion. Many of these are as tall or taller than a man ; active, strong, and intrepid ; cunning, lascivious, and cruel. This redoubtable rival of mankind is found in many parts of Africa, in the East Indies, in Madagascar, and in Borneo.¹ In the last of these places the people of quality course him as we do the stag ; and this sort of hunting is one of the favourite amusements of the king himself. This creature is extremely swift of foot, endowed with extraordinary strength, and runs with prodigious celerity. His skin is all hairy, his eyes sunk in his head, his countenance stern, his face tanned, and all his lineaments, though exactly human, harsh and blackened by the sun. In Africa this creature is even still more formidable. Battel calls him the *pongo*, and assures us that in all his proportions he resembles a man, except that he is much larger, even to a gigantic state. His face resembles that of a man, the eyes deep sunk in the head, the hair on each side ex-

¹ Le Comte's History of China.

tremely long, the visage naked and without hair, as also the ears and the hands. The body is lightly covered, and scarcely differing from that of a man, except that there are no calves to the legs. Still, however, the animal is seen to walk upon his hinder legs, and in an erect posture. He sleeps under trees, and builds himself a hut, which serves to protect him against the sun and the rains of the tropical climates, of which he is a native. He lives only upon fruits, and is no way carnivorous. He cannot speak, although furnished with a greater instinct than any other animal of the brute creation. When the negroes make a fire in the woods, this animal comes near and warms himself by the blaze. However, he has not skill enough to keep the flame alive by feeding it with fuel. They go together in companies, and if they happen to meet one of the human species remote from succour, they show him no mercy. They even attack the elephant, which they beat with their clubs, and oblige to leave that part of the forest which they claim as their own. It is impossible to take any of these dreadful creatures alive, for they are so strong that ten men would not be a match for but one of them. None of this kind, therefore, are taken except when very young, and these but rarely, when the female happens to leave them behind; for in general they keep clung to the breast, and adhere both with legs and arms. From the same traveller we learn, that when one of these animals dies, the rest cover the body with a quantity of leaves and branches. They sometimes also show mercy to the human kind. A negro boy, that was taken by one of these, and carried into the woods, continued there a whole year, without receiving any injury.¹ From another traveller we learn, that these animals often attempt to surprise the female negroes as they go into the woods, and frequently keep them against their wills for the pleasure of their company, feeding them very plentifully all the time. He assures us, that he knew a woman of Loango that had lived among these animals for three years. They grow from six to seven feet high, and are of unequalled strength. They build sheds, and make use of clubs for their defence. Their faces are broad, their noses flat, their ears without a tip, their skins are more bright than that of a mulatto, and they are covered on many parts of the body with long and tawny-coloured hair. Their belly is large, their heels

¹ Le Brosse, as quoted by Buffon, vol. xxviii. p. 70.

flat, and yet rising behind. They sometimes walk upright, and sometimes upon all-fours, when they are fantastically disposed.*

From this description of the oran-outang, we perceive at what a distance the first animal of the brute creation is placed from the very lowest of the human species. Even in countries peopled with savages, this creature is considered as a beast; and in those very places where we might suppose the smallest difference between them and mankind, the inhabitants hold it in the greatest contempt and detestation. In Borneo, where this animal has been said to come to its greatest perfection, the natives hunt it in the same manner as they pursue the elephant or the lion, while its resemblance to the human form procures it neither pity nor protection. The gradations of Nature in the other parts of nature are minute and insensible; in the passage from quadrupeds to fishes we can scarcely tell where the quadruped ends and the fish begins; in the descent from beasts to insects we can hardly distinguish the steps of the progression; but in the ascent from brutes to man, the line is strongly drawn, well marked, and unpassable. It is in vain that the oran-outang resembles man in form, or imitates many of his actions; he still continues a wretched helpless creature, pent up in the most gloomy part of the forest, and, with regard to the provision for his own happiness, inferior even to the elephant or the beaver in sagacity. To us, indeed, this animal seems much wiser than it really is. As we have long been used to measure the sagacity

* Pere Caubasson brought up an oran-outang, which, became so fond of him, that, wherever he went, it always seemed desirous of accompanying him: whenever, therefore, he had to perform the service of his church, he was under the necessity of shutting it up in a room. Once, however, the animal escaped, and followed the father to the church; where, silently mounting the sounding board above the pulpit, he lay perfectly still till the sermon commenced. He then crept to the edge, and, overlooking the preacher, imitated all his gestures in so grotesque a manner, that the whole congregation were unavoidably urged to laugh. The father, surprised and confounded at this ill-timed levity, severely rebuked his audience for their inattention. The reproof failed in its effect; the congregation still laughed, and the preacher, in the warmth of his zeal, redoubled his vociferations and his actions; these the ape imitated so exactly, that the congregation could no longer restrain themselves, but burst out into a loud and continued laughter. A friend of the preacher at length stepped up to him, and pointed out the cause of this improper conduct; and such was the arch demeanour of his animal, that it was with the utmost difficulty he could command the muscles of his countenance, and keep himself apparently serious, while he ordered the servants of the church to take him away.

of all actions by their similitude to our own, and not their fitness to the animal's way of living, we are pleased with the imitations of the ape, even though we know they are far from contributing to the convenience of its situation. An ape, or a quadruped, when under the trammels of human education, may be an admirable object for human curiosity, but is very little advanced by all its learning in the road to its own felicity. On the contrary, I have never seen any of these long-instructed animals that did not, by their melancholy air, appear sensible of the wretchedness of their situation. Its marks of seeming sagacity were merely relative to us, and not to the animal ; and all its boasted wisdom was merely of our own making.

There is, in fact, another circumstance relative to this animal, which ought not to be concealed. I have many reasons to believe that the most perfect of the kind are prone, like the rest of the quadruped creation, and only owe their erect attitude to human education. Almost all the travellers who speak of them, mention their going sometimes upon all-fours, and sometimes erect. As their chief residence is among trees, they are without doubt usually seen erect while they are climbing ; but it is more than probable that their efforts to escape upon the ground are by running upon the hands and feet together. Schouten, who mentions their education, tells us that they are taken in traps, and taught in the beginning to walk upon their hind legs ; which certainly implies that in a state of nature they run upon all-fours. Add to this, that, when we examine the palms of their hands and the soles of their feet, we find both equally callous and beaten : a certain proof that both have been equally used. In those hot countries, where the apes are known to reside, the soles of the negroes' feet, who go bare-foot, are covered with a skin above an inch thick ; while their hands are as soft as those of a European. Did the apes walk in the same manner, the same exercise would have furnished them with similiar advantages, which is not the case. Besides all this, I have been assured by a very credible traveller, that these animals naturally run in the woods upon all-fours ; and when they are taken, their hands are tied behind them, to teach them to walk upright. This attitude they learn after some time ; and, thus instructed, they are sent into Europe to astonish the speculative with their near approaches to humanity, while it is never

considered how much is natural, and how much has been acquired in the savage schools of Benin and Angola.

The animal next to these, and to be placed in the same class, is the APE, properly so called, or the PITHEKOS of the ancients. This is much less than the former, being not above a foot and a half high, but walks erect, is without a tail, and is easily tamed.

Of this kind also is the GIBBON, so called by Buffon, or the LONG-ARMED APE, which is a very extraordinary and remarkable creature.* It is of different sizes, being from four feet to two

* The Gibbon, *simia lar* of Linnaeus, is distinguished in common with the other Gibbons by the enormous length of the anterior extremities. The arms, when the animal stands erect, very nearly touch the ground. The eyes are large and deeply seated—the nose is flat—and the ears not unlike the human. There is a circle of gray hairs passing over the eyes, cheeks, and under the lower jaw, which completely surrounds the visage and gives a very singular appearance to the animal. The hair also on the backs of the hands and feet is gray, in all other parts of the animal it is black, as is also the skin. The Gibbon has not been found exceeding four feet in height.

The disposition of this species is said to be gentle, its motions neither rude nor precipitate. It receives its food, which consists chiefly of fruits, almonds, &c., without greediness and without impatience. It suffers much from cold and from a low temperature, and seldom survives long removal from its native country. The parts of the East Indies in which it is most commonly found, are the coasts of Coromandel, the peninsula of Malacca, and the Molucca islands. It is probable also, that the Gibbon may be found in some of the less southern provinces of India, travellers having described an animal called Fefe, found on the frontiers of China to which they attribute much of the characters peculiar to the *simia lar*.

The ash-coloured Gibbon, or Wou-wou, differs little from the *simia lar*, except in colour. The arms are also said to be longer, and the posterior callosities larger than those of the black Gibbon.

There is also a species called the little Gibbon, which is about one-third less than the great Gibbon, but it has precisely the same form and proportions. The face is surrounded with gray hairs, forming altogether a circle different in shape from that of the larger species as appears by the figure. The top or crown of the head is blacker than the body. It has a small beard and whiskers.

Another species of the long-armed apes, is the SIAMANG. The general description of this Gibbon accords with that of the others of this sub-division of the apes; it seems therefore only necessary to advert to those particulars wherein it differs from its congeners; the most prominent of these is probably, that the first and second fingers of the hinder extremities are united as far as the middle of the second phalanx; the colour is black all over, without the white circle about the face; it has two loose naked folds of skin on the throat which are occasionally inflated. The hair is long and soft; but the face is without any, as are also the breasts of the female. The orbits of the eye are circular and remarkably prominent, and the canine teeth are long.

feet high. It walks erect, is without a tail, has a face resembling that of a man, with a circle of bushy hair all round the visage ; its eyes are large, and sunk in its head ; its face tanned, and its ears exactly proportioned. But that in which it chiefly differs from all others of the monkey tribe, is the extraordinary length of its arms, which when the animal stands erect are long enough to reach the ground ; so that it can walk upon all-fours, and yet

These animals are very common in Sumatra. They are generally found assembled in large troops, conducted, as it is said, by a chief, whom the Malays believe to be invulnerable. Thus assembled at sunrise and again at sunset, they vie with each other in making the most dreadful cries, perfectly stunning to those accustomed to them, and frightful in the highest degree to strangers. Their powers of voice are doubtless increased by the guttural cavity before alluded to, analogous to a similar apparatus found in the howling monkeys of America. At all other times they appear to be perfectly quiet, so long at least as they are undisturbed. Naturally slow and heavy, they seem to want courage for climbing and activity for leaping, so that when suddenly surprised, they may in general be taken with ease ; but nature, while she has deprived them of the power of avoiding danger by quickness and address, has endowed them with a great degree of vigilance for their preservation, so that they are generally alive to danger long enough before it reaches them to enable them to effect their retreat. When on the ground, however, they fall an easy prey, overcome by fear and rendered apparently more incapable by conscious weakness ; in this situation their ineffectual efforts to fly display their imperfections, for the body too high and heavy for their short and slender thighs inclines forward, and their disproportioned arms acting like stilts, enable them to advance only by short and inefficient jumps.

Another species or variety is the ACTIVE GIBBON, which is distinguished from the preceding Gibbon of Sumatra, in which island this also is found, by its greater degree of activity, particularly in a state of nature. It is nearly three feet in height ; the face is naked, of a very dark blue colour, lightly tinted with brown in the female ; the eyes are near each other, and sunken ; and the muzzle is remarkably prominent. The nose is not so flat as that of the Siamang, and the nostrils are large and open laterally. The chin is furnished with a few black hairs. The ears are nearly hidden by the long hair around them, and there is a white band round the upper part of the face. The colour of this species seems to vary in different individuals and sexes, and in the same individual at different periods ; but brown, with various shades, appears the prevailing tint.

The active Gibbon is not gregarious like the Siamang, but is generally found only with its female. It springs from tree to tree with wonderful agility, and can therefore but seldom be taken alive. In captivity, however, it exhibits little or nothing of its active powers, and though much more lively than the Siamang, is less so than the monkeys in general. Not given to the exciteless apathy of the Siamang, it may be frightened and quieted again : it avoids danger, and courts caresses : is a considerable glutton, curious familiar, and sometimes even gay.

keep its erect posture at the same time. This animal, next to the oran-outang and the ape, most nearly resembles mankind, not only in form, but in gentle manners and tractable disposition. It is a native of the East Indies, and particularly found along the coasts of Coromandel.

The last of the ape kind is the *CYNOCEPHALUS*, or the *MAGOT* of Buffon.* This animal wants a tail, like the former, although there is a small protuberance at that part, which yet is rather formed by the skin than the bone. It differs also in having a large callous red rump. The face is prominent, and approaches more to that of quadrupeds than of man. The body is covered with a brownish hair, and yellow on the belly. It is about three feet and a half, or four feet high, and is a native of most parts of Africa and the East. As it recedes from man in its form, so also it appears different in its dispositions, being sullen, vicious, and untractable.¹

THE BABOON.

DESCENDING from the more perfect of the monkey kinds, we come to the baboon and its varieties, a large, fierce, and formi-

* The Magot or Barbary Ape, placed by Cuvier at the head of the baboons, is an animal not without intelligence. It is to his intelligence that the magot owes the numberless torments inflicted upon him by the mountebanks and showmen. Excepting the orans and the gibbons, he is the only monkey of the Old Continent capable of receiving a certain degree of instruction. The others, stupid or ferocious, were incapable in a state of slavery of comprehending any thing; but they have the consequent advantage of preserving their repose, while the magot is constantly exposed to lose both his comfort and freedom. Notwithstanding this, the male magot only submits to the dominion of man in extreme youth, and when his active faculties have not yet acquired their complete force and development. Arrived at adolescence he begins to be less tractable, and, in a short time, refuses submission of every kind. Good treatment and bad, are equally without effect upon him. Alike incapable of confidence and of fear, he evinces nothing but a savage love of independence, which appears to be his only want. The painful state into which this feeling throws him, especially when it is strongly excited by severity, soon plunges him into a melancholy which is speedily followed by consumption and death.

The Magot is considered more properly to belong to the Monkeys than the Baboons, as the mere absence of a tail is insufficient to characterize the larger divisions of the monkey tribe. The same may be said of what is called the *Black Ape*, a monkey of extremely rare occurrence.

1 Omnes femellæ hujusce et precedentium, ut et fere sequentium specierum, menstruali patiuntur fluxu sicut in feminis.

dable race, that, mixing the figure of the man and the quadruped in their conformation, seem to possess only the defects of both; the petulance of the one, and the ferocity of the other. These animals have a short tail; a prominent face, with canine teeth, larger than those of men; and callosities on the rump. In man the physiognomy may deceive, and the figure of the body does not always lead to the qualities of the mind; but in animals we may always judge of their dispositions by their looks, and form a just conjecture of their internal habits from their external form. If we compare the nature of the ape and the baboon by this easy rule, we shall at once be led to pronounce that they greatly differ in their dispositions, and that the latter are infinitely more fierce, savage, and malicious, than the former. The oran-outang, that so nearly resembles man in its figure, approaches also nearest in the gentleness of its manners and the pliancy of its temper. The cynocephalus, that of all other apes is most unlike man in form, and approaches nearer the dog in face, resembles also the brute in nature, being wild, restless, and impelled by a fretful impetuosity. But the baboon, who is still more remote, and resembles man only in having hands, who from having a tail, a prominent face, and sharp claws, approaches more nearly to the savage tribe, is every way fierce, malicious, ignorant, and untractable.

The BABOON, properly so called, is from three to four feet high, very strong built, with a thick body and limbs, and canine teeth, much longer than those of men. It has large callosities behind, which are quite naked and red. Its tail is crooked and thick, and about seven or eight inches long. Its snout, for it can hardly be called a face, is long and thick, and on each side of its cheeks it has a pouch, into which, when satiated with eating, it puts the remainder of its provisions. It is covered with long thick hair, of a reddish brown colour, and pretty uniform over the whole body. It walks more commonly upon all fours than upright, and its hands as well as its feet are armed with long sharp claws, instead of the broad round nails of the ape kind.*

1 Buffon, vol. xxxviii. p. 183.

* In the true Baboons the facial angle of the adult varies from 30° to 35° and the superciliary crests are for the most part considerably elevated, as is also the ridge on the back of the head formed by the attachment of the temporal muscles, which as well as the canine teeth are large and powerful.

An animal thus made for strength, and furnished with dangerous weapons, is found, in fact, to be one of the most formidable of the savage race in those countries where it is bred. It appears in its native woods, to be impelled by two opposite passions ; a hatred for the males of the human species, and a desire for women. Were we assured of these strange oppositions in its disposition from one testimony alone, the account might appear doubtful : but as it comes from a variety of the most credible witnesses, we cannot refuse our assent. From them therefore, we learn, that these animals will often assail women in a body, and force them into the woods, where they keep them against their will and kill them when refractory. From the Chevalier Forbin we learn, that in Siam whole troops of these will often sally forth from their forests, and attack a village when they know the men are engaged in their rice harvest. They are on such occasions actuated as well by desire as by hunger ; and not only plunder the houses of whatever provisions they can find but endeavour to force the women. These, however, as the Chevalier humorously relates, not at all liking either the manners or the figure of the paltry gallants, boldly stand on their defence, and with clubs, or whatever other arms they can provide, instead of answering their caresses, oblige their ugly visitors to retreat ; not, however, before they have damaged or plundered every thing eatable they can lay their hands on.

The cheeks are furnished with pouches capable of much distension ; and the muzzle terminates in a flattened extremity like that of the dog, on which the openings of the nostrils are situated. The tail is generally as long as, and sometimes even longer than the body ; but in several of the species it is extremely short. The callosities are frequently of large size and disgustingly conspicuous. This genus is generally considered as the lowest in organization, and consequently in capacity and intelligence, of the tribe to which it belongs.

The colour of the common baboon is reddish brown ; his face and hands are black, and his upper eye-lids white. The hair of his cheeks forms a considerable tuft on each side ; and the under surface of his body is but sparingly covered. In bulk he is equal to a middle sized dog ; his proportions are thickset and inelegant ; he is by no means dull or inactive. When young he is gay, playful, and docile ; but as he grows older he becomes untractable, malicious, and ferocious. He is sometimes even dangerous, his muscular strength and agility together, with the great power of his teeth and jaws rendering him a formidable opponent. On this account it is absolutely necessary to keep him strictly confined. He is a native of Africa, and more especially of the tropical parts of its western coast.

At the Cape of Good Hope, they are less formidable, but to the best of their power, equally mischievous. They are there under a sort of natural discipline, and go about whatever they undertake with surprising skill and regularity. When they set about robbing an orchard or a vineyard, for they are extremely fond of grapes, apples, and ripe fruit, they do not go singly to work, but in large companies, and with preconcerted deliberation. On these occasions, a part of them enter the inclosure, while one is set to watch. The rest stand without the fence, and form a line reaching all the way from their fellows within, to their rendezvous without, which is generally in some craggy mountain. Every thing being thus disposed, the plunderers within the orchard throw the fruit to those that are without as fast as they can gather it; or if the wall or hedge be high, to those that sit on the top; and these hand the plunder to those next them on the other side. Thus the fruit is pitched from one to another all along the line, till it is safely deposited at their head-quarters. They catch it as readily as the most skillful tennis-player can a ball; and while the business is going forward, which they conduct with great expedition, a most profound silence is observed among them. Their sentinel during this whole time continues upon the watch, extremely anxious and attentive; but if he perceives any one coming, he instantly sets up a loud cry, and at this signal the whole company scamper off. Nor yet are they at any time willing to leave the place empty-handed; for if they be plundering a bed of melons, for instance, they go off with one in their mouths, one in their hands, and one under their arm. If the pursuit is hot, they drop first that from under their arm, then that from their hand; and, if it be continued, they at last let fall that which they had hitherto kept in their mouths.

The natives of the Cape often take the young of these animals, and, feeding them with sheep and goat's milk, accustom them to guard their houses; which duty they perform with great punctuality. Those, however, that have been brought into Europe, are headstrong, rude, and untractable. Dogs and cats, when they have done any thing wrong, will run off; but these seem careless and insensible of the mischief they do; and I have seen one of them break a whole table of china, as it should seem by design, without appearing in the least conscious

of having done amiss. It was not, however, in any respect so formidable as that described by Mr Buffon, of which he gives the following description:—"It was not," says he, "extremely ugly, and yet it excited horror. It continually appeared in a state of savage ferocity, gnashing its teeth, flying at the spectators, and furiously restless. It was obliged to be confined in an iron cage, the bars of which it so forcibly attempted to break, that the spectators were struck with apprehension. It was a sturdy bold animal, whose short limbs and powerful exertions showed vast strength and agility. The long hair with which it was covered seemed to add to its apparent abilities; which however, were in reality so great, that it could easily overcome a single man, unless armed. As to the rest, it for ever appeared excited by that passion which renders the mildest animals at intervals furious. Its lasciviousness was constant, and its satisfactions particular. Some others also of the monkey kind showed the same degree of impudence, and particularly in the presence of women; but, as they were less in size, their petulance was less obvious, and their insolence more easily corrected."

But however violent the desires of these animals may be, they are not found to breed in our climate. The female brings forth usually but one at a time, which she carries in her arms, and in a peculiar manner clinging to her breast. As to the rest, these animals are not at all carnivorous; they principally feed upon fruits, roots, and corn, and generally keep together in companies. The internal parts are more unlike those of man than of quadrupeds, particularly the liver, which is, like that of a dog, divided into six lobes. The lungs are more divided, the guts in general are shorter, and the kidneys rounder and flatter.

The largest of the baboon kind is the MANRIL; an ugly disgusting animal, with a tail shorter than the former, though of a much larger stature, being from four to five feet high. The muzzle is still longer than that of the preceding, it is of a bluish colour, and strongly marked with wrinkles, which give it a frightful appearance. But what renders it truly loathsome is, that from the nose there is always seen issuing a snot, which the animal takes care at intervals to lick off with its tongue, and swallow. It is a native of the Gold Coast; it is said to walk more frequently erect than upon all-fours; and when displeased, to weep like a child. There was one of them shown in England

some years ago. It seemed tame, but stupid, and had a method of opening its mouth and blowing at such as came too near.

The WANDEROW is a baboon rather less than the former, with the body less compact and muscular, and the hinder parts seemingly more feeble. The tail is from seven to eight inches long; the muzzle is prominent, as in the rest of this kind; but what particularly distinguishes it, is a large long white head of hair, together with a monstrous white beard, coarse, rough, and descending; the colour of the rest of the body being brown or black. As to the rest, in its savage state, it is equally fierce with the others; but, with a proper education, it seems more tractable than most of its kind, and is chiefly seen in the woods of Ceylon and Malabar.*

The MAIMON of Buffon which Edwards calls the PIGTAIL, is the last of the baboons, and in size rather approaches the monkey, being no larger than a cat. Its chief distinction, besides its prominent muzzle, like a baboon, is in the tail, which is about five or six inches long, and curled up like that of a hog; from which circumstance, peculiar to this animal, our English naturalists gave it the name. It is a native of Sumatra, and does not well endure the rigours of our climate. Edwards, however, kept one of them a year in London; and another of them happening at the same time to be exposed in a show of beasts, he brought the two exiles together, to see if they would claim or acknowledge their kindred. The moment they came into each other's presence, they testified their mutual satisfaction, and seemed quite transported at the interview.†

* The Wanderoos belong to that group of the Monkey tribes of the Old World which has received its name from the Macaque, as being probably the most common of all the species that compose it. This group or genus is distinguished by a blunt and elongated muzzle, forming a facial angle of from 40° to 45° ; by the prominence of the superciliary crests, which overhang the eyes and give a peculiar expression to the physiognomy; by the retrocession of the forehead above; and by the comparative shortness of the tail, which is rarely equal in length to the body, but is in some species nearly reduced to the dwarfishness of a pig-tail, and in one or two others is nothing more than a mere tubercle. In their manners there is considerable variety, dependent in a great degree upon their age, and the society to which they have been accustomed.

† *The Dog-Faced Baboon.*—They are betwixt four and five feet high; their head and face greatly resemble that of a dog; the hair is of a dusky colour, and peculiarly long and shaggy, as far as the waist, but short on the hinder parts. The face is naked, and the ears are pointed and concealed in

THE MONKEY.

THE varieties in the larger tribes of the monkey kind are but few; in the ape we have seen but four, and in the baboon about as many. But when we come to the smaller class, the differences among them seem too tedious for enumerations. These, as was observed in the beginning, are all small in stature, and with long tails, by which they are distinguished from the preceding, that entirely want the tail, or are large, and have but a short one. The varieties in the form and colour of dogs, or squirrels, is nothing to what are found among monkeys of the smaller kind. Bosman mentions above fifty sorts on the Gold Coast alone, and Smith confirms the account. Condamine asserts that it would take up a volume to describe the differences of these to be found along the river Amazons; and we are sure that every one of these is very different from those on the African coast. Naturalists, however, have undertaken to make a catalogue of their numbers; and they either transmit their descriptions from one to another, or only enumerate those few that have found their way to Europe, and have fallen within the narrow circle of their own observation. But though it may be proper enough to describe such as fall under notice, it is certainly wrong to offer a scanty catalogue as complete, and to induce the reader to suppose he sees a picture of the whole group of these animals, when he is only presented with a small part of the number. Such, therefore, as are fond of the reputation of adding new descriptions to the stock of natural history, have here a

the fur. The dog-faced baboons are natives of various parts of Africa and Asia. These animals usually associate in vast companies. When travellers pass near their haunts, they are impudent enough to run into the nearest trees, and shake the boughs with great vehemence, at the same time chattering very loudly. They are so powerful, as, without any difficulty, to overcome a man; and they frequently commit such depredations in cultivated grounds, that the proprietors are compelled to have armed men continually on the watch to prevent them from plundering.

Amongst the mountains in the neighbourhood of the Cape of Good Hope, there are immense troops of these baboons, or of a variety very nearly allied to them.* When any one approaches their haunts, they set up a universal and horrible cry for a minute or two, and then conceal themselves in their fortresses, and keep a profound silence. They seldom descend to the plains, except for the purpose of plundering the gardens that lie near the foot of the mountains.

* The Ursine Baboon.

wide, though surely a barren, field to enlarge in ; and they will find it no difficult matter, by observing the various animals of this kind that are from time to time brought from their native coasts to this country, to indulge in description, and to ring the changes upon all the technical terms with which this most pleasing science is obscured and rendered disgusting. For my own part, I will spare the reader and myself the trouble of entering into an elaborate description of each ; content with observing once more, that their numbers are very great, and their differences very trifling. There is scarcely a country in the tropical climates that does not swarm with them, and scarcely a forest that is not inhabited by a race of monkeys distinct from all others. Every different wood along the coasts of Africa may be considered as a separate colony of monkeys, differing from those of the next district in colour, in size, and malicious mischief. It is indeed remarkable, that the monkeys of two cantons are never found to mix with each other, but rigorously to observe a separation : each forest produces only its own ; and these guard their limits from the intrusion of all strangers of a different race from themselves. In this they somewhat resemble the human inhabitants of the savage nations among whom they are found, where the petty kingdoms are numerous, and their manners opposite. There, in the extent of a few miles, the traveller is presented with men speaking different languages, professing different religions, governed by different laws, and only resembling each other in their mutual animosity.

In general, monkeys of all kinds, being less than the baboon, are endued with less powers of doing mischief. Indeed, the ferocity of their nature seems to diminish with their size ; and when taken wild in the woods, they are sooner tamed, and more easily taught to imitate man, than the former. More gentle than the baboon, and less grave and sullen than the ape, they soon begin to exert all their sportive mimicries, and are easily restrained by correction. But it must be confessed that they will do nothing they are desired without beating ; for, if their fears be entirely removed, they are the most insolent and headstrong animals in nature.

In their native woods they are not less the pests of man than of other animals. The monkeys, says a traveller,¹ are in posses-

¹ Description Historique de Macacar, p. 51.

sion of every forest where they reside, and may be considered as the masters of the place. Neither the tiger, nor the lion itself, will venture to dispute the dominion, since these, from the tops of trees, continually carry on offensive war, and by their agility escape all possibility of pursuit. Nor have the birds less to fear from their continual depredations; for, as these harmless inhabitants of the wood usually build upon trees, the monkeys are for ever on the watch to find out and rob their nests; and such is their petulant delight in mischief, that they will fling their eggs against the ground, when they want appetite or inclination to devour them.

There is but one animal in all the forest that ventures to oppose the monkey, and that is the serpent. The larger snakes are often seen winding up the trees where the monkeys reside; and, when they happen to surprise them sleeping, swallow them whole, before the little animals have time to make a defence. In this manner, the two most mischievous kinds in all nature keep the whole forest between them; both equally formidable to each other, and for ever employed in mutual hostilities. The monkeys in general, inhabit the tops of trees, and the serpents cling to the branches nearer the bottom, and in this manner they are for ever seen near each other, like enemies in the same field of battle. Some travellers, indeed, have supposed that their vicinity rather argued their mutual friendship, and that they united in this manner to form an offensive league against all the rest of animated nature.¹ "I have seen these monkeys," says Labat, "playing their gambols upon those very branches on which the snakes were reposing, and jumping over them without receiving any injury, although the serpents of that country were naturally vindictive, and always ready to bite whatever disturbed them. These gambols, however, were probably nothing more than the insults of an enemy that was conscious of its own safety; and the monkeys might have provoked the snake in the same manner as we often see sparrows twitter at a cat. However this be, the forest is generally divided between them; and these woods, which nature seems to have embellished with her richest magnificence, rather inspire terror than delight, and chiefly serve as retreats for mischief and malignity.

¹ Labat. Relat. de l'Afrique Occident. p 318.

The enmity of these animals to mankind is partly ridiculous, and partly formidable. They seem, says Le Compte and others, to have a peculiar instinct in discovering their foes, and are perfectly skilled when attacked, in mutually defending and assisting each other. When a traveller enters among these woods, they consider him as an invader upon their dominions, and all join to repel the intrusion. At first they survey him with a kind of insolent curiosity. They jump from branch to branch, pursue him as he goes along, and make a loud clattering, to call the rest of their companions together. They begin their hostilities by grinning, threatening, and flinging down the withered branches at him, which they break from the trees; they even take their excrements in their hands, and throw them at his head. Thus they attend him wherever he goes; jumping from tree to tree with such amazing swiftness, that the eye can scarcely attend their motions. Although they take the most desperate leaps, yet they are seldom seen to come to the ground, for they easily fasten upon the branches that break their fall, and stick, either by their hands, feet, or tail, wherever they touch. If one of them happens to be wounded, the rest assemble round, and clap their fingers into the wound, as if they were desirous of sounding its depth. If the blood flows in any quantity, some of them keep it shut up, while others get leaves, which they chew, and thrust into the opening: however extraordinary this may appear, it is asserted to be often seen, and to be strictly true. In this manner, they wage a petulant, unequal war; and are often killed in numbers before they think proper to make a retreat. This they effect with the same precipitation with which they at first came together. In this retreat the young are seen clinging to the back of the female, with which she jumps away, seemingly unembarrassed by the burden.

The curiosity of the Europeans has, in some measure, induced the natives of the places where these animals reside to catch or take them alive by every art they are able. The usual way in such case is to shoot the female as she carries her young, and then both, of course, tumble to the ground. But even this is not easily performed; for if the animal be not killed outright it will not fall; but clinging to some branch, continues, even when dead, its former grasp, and remains on the tree where it was shot until it drops off by putrefaction: in this manner it is

totally lost to the pursuer ; for to attempt climbing the tree, to bring either it or the young one down, would probably be fatal from the number of serpents that are hid among the branches. For this reason the sportsman always takes care to aim at the head ; which if he hits, the monkey falls directly to the ground and the young one comes down at the same time, clinging to its dead parent.

The Europeans along the coasts of Guinea often go into the woods to shoot monkeys ; and nothing pleases the negroes more than to see those animals drop, against which they have the greatest animosity. They consider them, and not without reason, as the most mischievous and tormenting creatures in the world ; and are happy to see their numbers destroyed, upon a double account ; as well because they dread their devastations, as because they love their flesh. The monkey, which is always skinned before it is eaten, when served up at a negro feast, looks so like a child, that an European is shocked at the very sight. The natives, however, who are not so nice, devour it as one of the highest delicacies ; and assiduously attend our sportsmen to profit by the spoil. But what they are chiefly astonished at, is to see our travellers carefully taking the young ones alive, while they leave them the old ones, that are certainly the most fit to be eaten. They cannot comprehend what advantage can arise to us from educating or keeping a little animal that by experience, they know to be equally fraught with tricks and mischief : some of them have even been led to suppose, that with a kind of perverse affection, we love only creatures of the most mischievous kinds : and having seen us often buy young and tame monkeys, they have taken equal care to bring rats to our factors, offering them for sale, and greatly disappointed at finding no purchaser for so hopeful a commodity.¹

The negroes consider these animals as their greatest plague ; and, indeed, they do incredible damage when they come in companies to lay waste a field of Indian corn, or rice, or a plantation of sugar-canes. They carry off as much as they are able ; and they destroy ten times more than they bear away. Their manner of plundering is pretty much like that of the baboons, already mentioned, in a garden. One of them stands sentinel

¹ Labat, *Relat. de l'Afrique Occident.* p. 317.

upon a tree, while the rest are plundering, carefully and cautiously turning on every side, but particularly to that on which there is the greatest danger: in the meantime, the rest of the spoilers pursue their work with great silence and assiduity; they are not contented with the first blade of corn, or the first cane that they happen to lay their hands on; they first pull up such as appear most alluring to the eye; they turn it round, examine, compare it with others, and if they find it to their mind, stick it under one of their shoulders. When in this manner they have got their load, they begin to think of retreating: but if it should happen that the owners of the field appear to interrupt their depredations, their faithful sentinel instantly gives notice, by crying out *Houp, houp, houp!* which the rest perfectly understand, and all at once throwing down the corn they hold in their left hands, scamper off upon three legs, carrying the remainder in the right. If they are still hotly pursued, they then are content to throw down their whole burden, and to take refuge among their woods, on the tops of which they remain in perfect security.

Were we to give faith to what some travellers assure us, of the government, policies, and subordination of these animals, we might perhaps be taxed with credulity; but we have no reason to doubt that they are under a kind of discipline, which they exercise among each other. They are generally seen to keep together in companies, to march in exact order, and to obey the voice of some particular chieftain remarkable for his size and gravity. One species of these which Mr Buffon calls the OUARINE, and which are remarkable for the loudness and distinctness of their voice, are still more so for the use to which they convert it. "I have frequently been a witness," says Margrave "of their assemblies and deliberations. Every day, both morning and evening, the ouarines assemble in the woods to receive instructions. When all come together, one among the number takes the highest place on a tree, and makes a signal with his hand to the rest to sit round, in order to hearken. As soon as he sees them placed, he begins his discourse with so loud a voice, and yet in a manner so precipitate, that, to hear him at a distance, one would think the whole company were crying out at the same time: however, during that time, one only is speaking; and all the rest observe the most profound silence. When this has done,

he makes a sign with the hand for the rest to reply ; and at that instant they raise their voices together, until by another signal of the hand they are enjoined silence. This they as readily obey ; till, at last, the whole assembly breaks up, after bearing a repetition of the same preachment."

The chief food of the monkey tribe is fruits, the buds of trees, or succulent roots and plants. They all, like man, seem fond of sweets ; and particularly the pleasant juice of the palm-tree and the sugar-cane. With these the fertile regions in which they are bred seldom fail to supply them ; but when it happens that these fail, or that more nourishing food becomes more agreeable, they eat insects and worms ; and sometimes, if near the coasts, descend to the sea-shore, where they eat oysters, crabs, and shell-fish. Their manner of managing an oyster is extraordinary enough ; but it is too well attested to fail of our assent. As the oysters in the tropical climates are generally larger than with us, the monkeys, when they go to the sea-side, pick up a stone, and clap it between the opening shells ; this prevents them from closing ; and the monkey then eats the fish at his ease. They often also draw crabs from the water, by putting their tail to the hole where that animal takes refuge, and, the crab fastening upon it, they withdraw it with a jerk, and thus pull their prey upon shore. This habit of laying traps for other animals makes them very cautious of being entrapped themselves ; and I am assured, by many persons of credit, that no snare, however nicely baited soever, will take the monkey of the West India islands ; for having been accustomed to the cunning of man, it opposes its natural distrust to human artifice.

The monkey generally brings forth one at a time, and sometimes two. They are rarely found to breed when brought over into Europe ; but of those that do, they exhibit a very striking picture of parental affection. The male and female are never tired of fondling their young one. They instruct it with no little assiduity ; and often severely correct it, if stubborn, or disinclined to profit by their example : they hand it from one to the other ; and when the male has done showing his regard, the female takes her turn. When wild in the woods, the female, if she happens to have two, carries one on her back, and the other in her arms : that on her back clings very closely, clasping its hands round her neck, and its feet about her middle : when she wants to suckle it,

she then alters their position ; and that which has been fed gives place to the other, which she takes in her arms. It often happens that she is unable to leap from one tree to another, when thus loaden ; and upon such occasions their dexterity is very surprising. The whole family form a kind of chain, locking tail in tail, or hand in hand, and one of them holding the branch above, the rest swing down, balancing to and fro, like a pendulum, until the undermost is enabled to catch hold of the lower branches of some neighbouring tree. When the hold is fixed below, the monkey lets go that which was above, and thus comes undermost in turn ; but, creeping up along the chain, attains the next branches, like the rest ; and thus they all take possession of the tree, without ever coming to the ground.

When in a state of domestic tameness, those animals are very amusing, and often fill up a vacant hour, when other entertainment is wanting. There are few that are not acquainted with their various mimics, and their capricious feats of activity. But it is generally in company with other animals of a more simple disposition, that their tricks and superior instincts are shown ; they seem to take a delight in tormenting them ; and I have seen one of them amusing itself for hours together, in imposing upon the gravity of a cat. Erasmus tells us of a large monkey, kept by Sir Thomas More, that, one day diverting itself in his garden, where some tame rabbits were kept, played several of its usual pranks among them, while the rabbits scarcely well knew what to make of their new acquaintance : in the meantime, a weasel, that came for very different purposes than those of entertainment, was seen peering about the place in which the rabbits were fed, and endeavouring to make its way, by removing a board that closed their hutch. While the monkey saw no danger, it continued a calm spectator of the enemy's effort ; but just when, by long labour, the weasel had effected its purpose, and had removed the board, the monkey stepped in, and, with the utmost dexterity, fastened it again in its place ; and the disappointed weasel was too much fatigued to renew its operations. To this I will only add what Father Carli, in his history of Angola, assures us to be true. In that horrid country, where he went to convert the savage natives to Christianity, and met with nothing but distress and disappointment ; while his health was totally impaired by the raging heats of the climate, his pa-

tience exhausted by the obstinacy of the stupid natives, and his little provisions daily plundered without redress, in such an exigency he found more faithful services from the monkeys than the men ; these he had taught to attend him, to guard him whilst sleeping, against thieves and rats, to comb his head, to fetch his water ; and he asserts, that they were even more tractable than the human inhabitants of the place. It is indeed remarkable, that in those countries where the men are most barbarous and stupid, the brutes are most active and sagacious. It is in the torrid tracts, inhabited by barbarians, that such various animals are found with instinct so nearly approaching reason. The savages, both of Africa and America, accordingly suppose monkeys to be men : idle, slothful, rational beings ; capable of speech and conversation ; but obstinately dumb, for fear of being compelled to labour.

As of all savages, those of Africa are the most brutal, so, of all countries, the monkeys of Africa are the most expert and entertaining. The monkeys of America are, in general, neither so sagacious nor so tractable, nor is their form so nearly approaching that of man. The monkeys of the new continent may be very easily distinguished from those of the old, by three marks. Those of the ancient continent are universally found to have a naked callous substance behind, upon which they sit ; which those of America are entirely without : those also of the ancient continent have the nostrils differently formed, more resembling those of men, the holes opening downward : whereas the American monkeys have them opening on each side ; those of the ancient world have pouches on each side the jaw, into which they put their provisions ; which those of America are without : lastly, none of the monkeys of the ancient continent hang by the tail, which many of the American sorts are known to do. By these marks the monkeys of either continent may be readily distinguished from each other, and prized accordingly. The African monkey, as I am assured, requires a longer education, and more correction, than that of America ; but it is at last found capable of more various powers of imitation, and shows a greater degree of cunning and activity.

Mr Buffon, who has examined this race of imitative beings with greater accuracy than any other naturalist before him, makes but nine species of monkeys belonging to the ancient continent ;

and eleven belonging to the new. To all these he gives the names which they go by in their respective countries; which, undoubtedly, is the method least liable to error, and the most proper for imitation.

Of the monkeys of the ancient continent, the first he describes is the *MACAGUO*; somewhat resembling a baboon in size, strength of body, and a hideous wrinkled visage: it differs, however, in having a very long tail, which is covered with tufted hair. It is a native of Congo.

The second is the *PATAS*, which is about the same size with the former; but differs in having a longer body, and a face less hideous: it is particularly remarkable for the colour of his hair, which is of a red, so brilliant, that the animal looks as if it were actually painted. It is usually brought from Senegal; and by some called the *red African monkey*.*

The third of the ancient continent is the *MALBROUK*;† of

* The Red Monkey of Pennant, the Patas of Buffon and the French writers, is well distinguished from all the other species by its peculiar colour and the singularity of its markings. The whole of the upper surface of its head, which is broad and flat, is of a deep rufous brown, which becomes lighter and assumes a rustier tinge on the back and on the outer sides of the limbs, and is continued along the tail until it is lost in the yellowish gray which terminates that organ. A patch of short dusky black hairs occupies the extremity of the nose, and extends upwards in a narrow line to the middle of the forehead, where it joins a series of long stiff coal-black hairs, forming an arch over each of the eyes, and separating the livid flesh-colour of the orbits and anterior part of the face from the red hairs which clothe the scalp. This double arch terminates in a somewhat expanded patch above the outer angles of the eyes. The sides of the upper lip are edged with a narrow line of the same short dusky hairs which cover the nose. Beneath the ears, which are blackish and moderately large, the hair forms broad thick bushy tufts of a light gray, which advance forwards upon the sides of the cheeks and lower jaw, so as to limit the naked part of the face to a narrow space between the eyes and the upper lip. From these tufts the hair is continued of the same colour on the whole of the under surface of the body, and on the inner sides of the limbs. The hands are dusky brown, with very short fingers, the thumb of the fore hand especially being reduced almost to a mere tubercle. The facial angle is moderately elongated, and the nose flattened. The body measures about sixteen inches in length, and the tail is nearly equal.

† This animal is one of the largest of the Guenon tribe. From muzzle to tail it is about a foot and a half in length. In walking on the earth he always supports himself on his four hands—but as he is essentially organized for the purposes of climbing and living in trees, his movements on the ground possess neither firmness nor facility. His hinder limbs being longer than the fore, the motion of the anterior part of his body cannot correspond to that of

which he supposes the monkey which he calls the *BONET CHINOIS* to be a variety. The one is remarkable for a long tail, and long beard; the other for a cap of hair that covers the crown of the head, from whence it takes the name. Both are natives of the East Indies; and the Bramins, who extend their charity to all the brute creation, have hospitals for such of them as happen to be sick, or otherwise disabled.

the posterior, the latter proceeding with the greater rapidity. This obliges him to carry the hinder parts sometimes to the right, and sometimes to the left, when he intends a slow motion, and to shoot forward by jumps when he is desirous to run. This conformation, so unfavourable for animals designed to live on the earth, is peculiarly advantageous for such as are sustained on fruits. The disproportioned length of the hinder limbs in comparison of the fore, is no impediment to climbing, but imparts on the contrary a wonderful degree of agility in shooting from branch to branch, and even from tree to tree. Accordingly, we find that these monkeys rarely descend to the earth. Assembled in troops, they dwell for the most part in those capacious canopies of verdant foliage which cover the rich forests of Southern Asia, fellow-citizens with the birds, exposed to no danger but from the larger of the serpent tribe, or the more insatiable rapacity of man. In these lofty retreats they are found in such numbers, as to annoy the traveller, as well by the petulance of their motions as the incessant iteration of their cries. Several specimens have been seen in Europe, of both sexes and of every age. There are no animals who can surpass them in agility. In confinement they are accustomed to shoot forward with such sustained vigour as to make several turnings in their course, as if flying, sustained in the air only by the impulse which they may receive from striking the walls of the cage. The Malbrouks seldom suffer their voices to be heard, and never but in a shrill and feeble cry, or rather in a dull sort of grunting noise. The males, in their youth, are sufficiently docile, but as soon as they arrive at adult age they become excessively malicious, even towards the persons intrusted with their care. The females remain more gentle, and alone appear susceptible of attachment. Circumspection forms a very peculiar trait in the character of the Malbrouk. He is nevertheless exceedingly irritable, but still, though subject to the most violent excitements from his ruling passions, he calculates all his movements with peculiar care, and executes them with surpassing dexterity. When he attacks, it is always from behind, and when the object of his resentment is unaware of his intention. He then precipitates himself upon him, wounds him with his teeth or nails, shoots away rapidly from within his reach, without however losing sight of him, and that as well for the purpose of seizing a favourable opportunity of renewing the attack, as to shelter himself from the vengeance of the adversary. This extreme irritability prevents the Malbrouk from ever being completely tamed, or brought to submit with patience to restraint. He is susceptible of no other education than that of nature. The moment he is treated with violence, the moment it is endeavoured to compel him to obedience, his petulance is at an end; he becomes melancholy and silent, and speedily expires.

The fourth of this kind is the MANGABEY; it may be distinguished from all others by its eye-lids, which are naked, and of a striking whiteness. It is a native of Madagascar.*

* This Monkey was called by Buffon the Mangabey from an erroneous idea that his specimens were obtained from the territory of that name in the Island of Madagascar: it appears, however, more probable that it is a native of the western coast of Africa. Its common English designation of the White Eyelid is certainly both expressive and appropriate; for although many others of the tribe, more especially among the Baboons, have the same remarkable absence of colouring matter in the skin of their upper eyelids, yet in none (excepting only in the following species) has it a hue so perfectly dead-white or so strongly contrasted with the colour of the face. The latter was formerly regarded as a mere variety of the present; but the distinctions between them appear to be permanent and are quite sufficient to justify their separation.

In the animal now under consideration the head, the whole of the upper surface and sides of the body, the tail, and the outsides of the limbs, are of one uniform deep grayish black, or more properly soot-colour, becoming deep black on the lower part of the legs and on the hands. On the under part of the moustaches, which are bushy, spreading and directed backwards, the fore part of the chest, the under surface of the body, and the inside of the limbs, the general colour is of a light gray with only a slight mixture of a dusky hue. The fingers are long and slender; the ears rather small and blackish; and the whole face livid, with a blacker tinge round the eyes, and on the nose, lips, and chin. The tail is thick and cylindrical, scarcely tapering towards the point, and generally turned backwards over the body, which it exceeds in length.

This species is not destitute of intelligence, and is easily taught to perform a variety of autic tricks, to the effect of which the peculiar expression of its physiognomy greatly contributes. It is generally good tempered, and tolerably well-behaved, although not without its fair share of petulance and caprice.

The Collared White Eyelid Monkey.—The Collared differs from the Common White Eyelid Monkey principally in the deep chestnut brown of the upper surface of its head, and in the collar of pure white crossing the fore part of its neck and including the large bushy moustaches which extend forwards upon the cheeks and pass backwards beneath and behind the ears. The rest of the upper surface of the body is of the same slaty or soot-coloured hue as that of the former; the hands, face, and ears have nearly the same tinge; and the under surface is equally of a light ashy gray. Its form and proportions are similar, except that it is somewhat smaller. The legs are equally slender, and the tail equally long and thick. The hair which covers the body is also, as in the preceding species, long and soft to the touch. A remarkable character in the dentition of both, rendered particularly obvious by the taste for grinning in which these animals are so prone to indulge, consists in the great breadth of the two middle incisors of the upper jaw. It is this character, which, together with the prominence of their canine teeth, produces that greater extension of muzzle on which their generic distinction has been chiefly founded.

The fifth is the *MONA*, or the *CEPHUS* of the ancients : it is distinguished by its colour, which is variegated with black and red ; and its tail is of an ash colour, with two white spots on each side at its insertion. It is a native of the northern parts of Africa.*

The sixth is the *CALLITRIX*, or *GREEN MONKEY* of St Iago, distinguished by its beautiful green colour on the back, its white breast and belly, and its black face.†

The seventh is the *MOUSTOC*, or *WHITE NOSE* ; distinguished by the whiteness of its lips, from whence it has received its name, the rest of the face being of a deep blue. It is a native of the Gold Coast, and a very beautiful little animal.

The eighth is the *TALAPOIN* ; and may be distinguished as well by its beautiful variety of green, white, and yellow hair, as by that under the eyes being of a greater length than the rest. It is supposed to be a native of Africa and the East.

* If elegance of form, grace of motion, gentleness of disposition, superior sagacity, and penetration, of physiognomy, presented characters to the naturalist proper for the purposes of classification, the *Mona*, or varied monkey, would, incontestably, serve as a type for peculiar division. It is strikingly distinguished from the other *Guenons* in general, by these qualities, and more especially from the *Malbrouk*, the *Callitrix*, and the *Grivet*. Even the *Mangabey*, though gentler than the others, is less so than the varied monkey. But this animal has no physical character, to confirm and establish the peculiar distinction to which its moral qualities would seem to entitle it. In truth the species of the varied monkey does not differ essentially from the other *Guenons* but by its colours, and in these we discover a variety, which we do not recognise in the other species. Its head is of a brilliant golden green, its back and sides are of a beautiful marron, variegated with black. The exterior portion of the limbs, and of the tail, a pure slate-coloured gray, and its neck, chest, belly, and the internal facing of the limbs, a shining white. On each side of its cheeks are thick whiskers of a straw-coloured yellow mixed with black points, there are also other variations of colour, which we forbear to insist on, under the fear of becoming tedious. This variety of colour made Buffon imagine that the *Mona* was the *Kebos* of the Greeks. But this is mere conjecture. The ancients have rarely described monkeys so as to enable us to recognise the species of which they spoke. They confine themselves to naming the animals, as if they were ignorant that languages partook of the destinies of nations, or as if they had written only for the advantage of their contemporaries. The appellation of *Mona*, a generic name in the East for all monkeys with long tails, has been bestowed by Buffon on this species in a manner no less arbitrary. However, as among us this name has no signification, it may assume without inconvenience this specific acceptance.

† As this monkey is found in Cape de Verd islands and the neighbouring part of Africa, it is one of a species most frequently imported into Europe.

The ninth and last of the monkeys of the ancient continent, is the *DOUC*, so called in Cochin-China, of which country it is a native. The *douc* seems to unite the characters of all the former together : with a long tail, like the monkey ; of a size as large as the baboon ; and with a flat face like the ape : it even resembles the American monkeys, in having no callosity on its posteriors. Thus it seems to form the shade by which the monkeys of one continent are linked with those of the other.

Next come the monkeys of the new continent ; which, as has been said, differ from those of the old, in the make of their nostrils, in their having no callosity on their posteriors, and in their having no pouches on each side of the jaw. They differ also from each other, a part of them making no use of their tails to hang by ; while others of them have the tail very strong and muscular, and serving by way of a fifth hand to hold by.* Those with muscular holding tails, are called *SAPAJOUS* ; those with feeble useless tails, are called *SAGOINS*. Of the *sapajous* there are five sorts : of the *sagoins* there are six.

The first of the *sapajous* is the *WARINE*, or the *BRAZILIAN GUARIBA*. This monkey is as large as a fox, with long black hair, and remarkable for the loudness of its voice. It is the largest of the monkey kind to be found in America.

The second is the *COATI* ; which may be distinguished from the rest by having no thumb, and consequently but four fingers on the two fore-paws. The tail, however, supplies the defects of the hand ; and with this the animal slings itself from one tree to another, with surprising rapidity.

The third is the *SAJOU* ; distinguished from the rest of the *sapajous* by its yellowish flesh-coloured face.

The fourth is the *SAL*. It is somewhat larger than the *sajou*, and has a broader muzzle. It is called also the *BEWAILER*, from its peculiar manner of lamenting when either threatened or beaten.

The fifth and last of the *sapajou* kind, or monkeys that hold by the tail, is the *SAMARI*, or *AURORA* ; which is the smallest and most beautiful of all. It is of a fine orange colour, with two

* There are no apes or monkeys without a tail known in America, and but one species with a tail shorter than the body, which was lately discovered by the Baron Humboldt.

circles of flesh round the eyes. It is a very tender, delicate animal, and held in high price.

Of the sagoins with feeble tails there are six kinds. The first and the largest is the SAKI, or CAGUI; so remarkable for the length of the hair on its tail, that it has been often termed the FOX-TAILED MONKEY. It is of different sizes; some being twice as large as others.

The second of this kind is the TAMAIN; which is usually black, with the feet yellow. Some, however, are found all over brown, spotted with yellow.

The third is the WISTITI; remarkable for the large tufts of hair upon its face, and its annulated tail.*

* *The Striated Monkey*.—This animal is, in size, no larger than a squirrel. The tail is long, very thickly covered with fur, and beautifully marked through its whole length, with alternate rings of black and white. The body is of a reddish ash-colour, slightly undulated with dusky shades. The face is of a dark flesh-colour, having on each side a very large and thick tuft of milk-white hair, standing out before the ears. The paws, which are covered with hair, have sharp nails. In a native state, these very beautiful little creatures, like most others of their tribe, live in society, on trees, the females carrying their young ones firmly clinging to their backs. They are found in the woods and forests of South America, where they are believed to subsist chiefly on fruits and vegetables; those, however, which have been kept in a state of captivity, have been known to feed on fish, insects, and worms. One that was brought to England in an East India ship, would eat nuts, but could not be prevailed with to touch ripe fruits. This creature was peculiarly fond of the smaller kinds of spiders and their eggs; but he uniformly refused the larger ones, as well as the large blue bottle-flies, though he frequently ate those of the common species.

The Entellus Monkey.—Although there is reason to believe that this is one of the most common Monkeys both of the Peninsula of Hindostan and of the islands of the Indian Archipelago, it has seldom been brought alive to this country. On the continent of Europe specimens appear to be almost equally rare. The species was first made known by M. Dufresne, in 1797, from a skin in his possession, which was shortly afterwards figured by Audubert in his large work on the Monkeys, whence it was adopted by later zoologists. After an interval of more than twenty years the arrival of a living individual, of small size and immature age, at the Jardin du Roi in Paris, enabled M. Frederic Cuvier to publish a second original figure, more valuable than the first as having been taken from the life. The same naturalist has subsequently given a still more striking and characteristic likeness of the adult animal, taken from a drawing sent from India by M. Duvaucel. These figures and the observations which accompany them constitute the sum of all that has hitherto been known to science respecting this very remarkable and interesting species.

The genus *Semnopithecus* of M. F. Cuvier, of which the *Entellus* offers a truly characteristic example, is distinguished from the other Monkeys of

The fourth is the *MARIKINA* ; with a mane round the neck, and a bunch of hair at the end of the tail, like a lion.

The fifth is called the *PINCH* ; with the face of a beautiful black, and white hair that descends on each side of the face, like that of man.

The last, least, and most beautiful of all, is the *MICO*, an animal too curiously adorned not to demand a particular description; which is thus given of it by Mr Condamine :—" That," says he, " which the governor of Para made me a present of, was the only one of its kind that was seen in the country. The hair on its body was of a beautiful silver colour, brighter than that of the most venerable human hair ; while the tail was of a deep brown, inclining to blackness. It had another singularity more remarkable than the former ; its ears, its cheeks, and lips, were tintured

the Old World by several remarkable characters, affecting not only its outward form but also some essential parts of its internal organization. In the degree of their intelligence, the form of their heads, and the general outline of their proportions, the species which compose it seem to occupy an intermediate station between two other purely Asiatic groups, the Gibbons of Buffon, which are the *Hylobates* of modern systematists, and the *Macaques*, of which the *Wanderoo* may be regarded as the type. Their bodies are slightly made ; their limbs long and slender ; their tails of great length, considerably exceeding that of the body ; their callosities of small size ; and their cheek-pouches, in those species which appear to possess them, so inconsiderable as scarcely to deserve the name. The character, however, which at once distinguishes them from the *Cercopitheci*, is found in their dentition, and more particularly in the form of the crown of the last molar tooth of the lower jaw, which, instead of four tubercles, one at each angle of the tooth as in the latter genus, offers five such projections on its surface, the additional one occupying the middle line of the tooth, and being placed posteriorly to the rest. The Gibbons and the *Macaques* are also furnished with this additional tubercle.

The *Entellus* is too distinct a species to be confounded with any other. It is of a uniform ashy-gray on the upper parts, becoming darker on the tail, which is grayish brown, of equal thickness throughout, and terminated by a few long hairs running out into a kind of point, but not forming a tuft. The under surface of the body is of a dingy yellowish white ; and the fore arms, hands, and feet are of a dusky black. The fingers of both extremities are very long, and the thumbs comparatively short. The face, which is black with somewhat of a violet tinge, is surmounted above the eyebrows by a line of long stiff black hairs, which project forwards and slightly upwards. On the sides of the cheeks and beneath the chin it is margined by a beard of grayish white passing along the line of the jaws and extending upwards in front of the ears, which are large and prominent, and of the same colour with the face. The hairs of the fore part of the head appear to diverge from a common centre.

with so bright a vermilion, that one could scarcely be led to suppose that it was natural. I kept it a year; and it was still alive when I made this description of it, almost within sight of the coasts of France: all I could then do was to preserve it in spirits of wine, which might serve to keep it in such a state as to show that I did not in the least exaggerate in my description.

OF THE MAKI.

THE last of the monkey kind are the makies; which have no other pretensions to be placed in this class, except that of having hands like the former, and making use of them to climb trees, or to pluck their food. Animals of the hare kind, indeed, are often seen to feed themselves with their fore-paws, but they can hold nothing in one of them singly, and are obliged to take up whatever they eat in both at once: but it is otherwise with the maki; as well as the monkey kinds, they seize their food with one hand, pretty much like a man, and grasp it with great ease and firmness. The maki, therefore, from this conformation in its hands both before and behind, approaches nearly to the monkey kind; but in other respects, such as the make of the snout, the form of the ears, and the parts that distinguish the sexes, it entirely differs from them. There are many different kinds of these animals; all varying from each other in colour or size, but agreeing in the human-like figure of their hands and feet, and in their long nose, which somewhat resembles that of a dog. As most of these are bred in the depths of the forest, we know little more concerning them than their figure. Their way of living, their power of pursuit and escape, can only be supposed, from the analogy of their conformation, somewhat to resemble those of the monkey.

The first of this kind is the mococo; a beautiful animal, about the size of a common cat, but the body and limbs slenderer, and of a longer make. It has a very long tail, at least double the length of its body; it is covered with fur, and marked alternately with broad rings of black and white. But what it is chiefly remarkable for, besides the form of its hands and feet, is the largeness of its eyes, which are surrounded with a broad black space; and the length of the hinder legs, which by far exceed those before. When it sleeps, it brings its nose to its belly, and its tail

over its head. When it plays, it uses a sort of galloping, with its tail raised over its back, which keeps continually in motion. The head is covered with dark ash-coloured hair; the back and sides with a red ash-colour, and not so dark as on the head; and the whole glossy, soft, and delicate, smooth to the touch, and standing almost upright like the pile of velvet. It is a native of Madagascar; appears to be a harmless gentle animal; and though it resembles the monkey in many respects, yet it has neither its malice nor its mischief: nevertheless, like the monkey, it seems to be always in motion; and moves, like all four-handed animals, in an oblique direction.

A second of this kind, which is also a native of Madagascar, is the *MONGOZ*; which is less than the former; with a soft glossy robe, but a little curled. The nose also is thicker than that of the *mococo*; the eyes are black, with orange-coloured circles round the pupil; and the tail is of one uniform colour. As to the rest, it is found of various colours; some being black, others brown; and its actions somewhat resemble those of a monkey.

The *VARI* is much larger than either of the former; its hair is much longer, and it has a kind of ruff round the neck, consisting of very long hair, by which it may be easily distinguished from the rest. It differs also in its disposition, which is fierce and savage; as also in the loudness of its voice, which somewhat resembles the roaring of the lion. This also is a native of Madagascar.

To this tribe we may refer a little four-handed animal, of the island of Ceylon, which Mr Buffon calls the *LORI*; very remarkable for the singularity of its figure.* This is, of all other

* The genus *Loris* forms part of that division of the *Quadrumanous Order* which is essentially distinguished by an unequal number or irregular disposition of the incisor teeth in the two jaws; terminal nostrils with sinuous openings; and a long subulate or sickle-shaped claw upon the fore-finger of the hinder hands, all the rest of the nails being flat and rounded like those of the greater part of the monkeys and of man. The *Loris* differ from the other genera of this family in having four incisors in the upper jaw, placed in pairs with a vacant space between, and six in the lower, directed obliquely forwards; canines of moderate size; twelve molars above and ten below; a short rounded head; and little or no tail. Sometimes, it would appear, the lateral incisors of the upper jaw, which are always smaller than the others, are either entirely wanting or so minute as not to be easily seen. In addition to these primary characters the *Loris* are distinguished by large prominent eyes, placed in front of the head, and at no great dis-

animals, the longest in proportion to its size ; having nine vertebræ in the loins ; whereas other quadrupeds have only seven.¹ The body appears still the longer by having no tail. In other respects, it resembles those of the Maki kind ; as well in its

tance from each other ; short ears, scarcely rising through the hair with which they are invested ; a rough tongue ; nostrils projecting beyond the mouth, and surrounded by a naked muzzle ; and thumbs widely separated from the fingers both on the fore and hinder hands.

Linnaeus confounded both the well authenticated species of this group, the slender Loris and the slow paced Loris, under the name of *Lemur tardigradus*.

The slow-paced Lemur is an animal of small size scarcely equal to that of a cat. The largest individual yet noticed appears to be that seen by Pennant, who states its length at no less than sixteen inches from the nose to the extremity of its back. Its proportions are short and thickset ; and the apparent clumsiness of its form is much increased by the manner in which it usually contracts itself into a kind of ball.

The habits of this singular creature are perfectly nocturnal. It sleeps throughout the whole of the day, unless when disturbed, either rolled up on the floor of its cage, or more commonly suspended by its paws from the bars, with its body drawn together and its head folded in upon the breast. Towards evening it rouses itself by degrees, and remains watchful during the night. Its first care on awaking is to make itself clean by licking its fur like a cat ; and its next is to satisfy its appetite. Its natural food appears to consist of a mixture of animal and vegetable substances. The latter, especially the sweeter fruits, and sopped bread sprinkled with sugar have usually formed the principal part of the diet of those with whose history we have been made acquainted ; but the smaller animals, whether mice, birds, or insects, appears to be more peculiarly acceptable. In its motions, it is excessively slow and languid. When on the ground, its posture is constrained and unnatural, and it rather drags itself along than walks. On a tree, or in mounting the bars of its cage, it seems more at its ease, but still moves with slow and cautious regularity. Grasping a branch or a bar in the first place tightly with one of its fore paws, it gradually fixes the other, and then advances its hinder hands with equal slowness and precision, never quitting to hold with the one until it has ascertained the firmness of its grasp with the other.

In consequence, as we may imagine, of this want of activity, the Slow-paced Lemur is peculiarly susceptible of cold, to guard it from which its thick fur, so unusual in the animals of a tropical climate, is beautifully adapted. Generally speaking it is a timid and even a gentle animal, rarely offering offence unless when provoked or hastily disturbed from its slumbers. On such occasions it will bite with considerable fierceness. But in cold weather, its anger is much more easily roused, and it evinces an excessive degree of irritability. Notwithstanding its apparent slothfulness it is easily disturbed, more especially by any unusual sound, the complicated structure of its large open organs of hearing rendering them peculiarly susceptible. It seems to become after a time in some degree familiar with

I Buffon, vol. xxvi. p. 271.

hands and feet, as in its snout, and in the glossy qualities of its hair. It is about the size of a squirrel ; and appears to be a tame, harmless little animal.

those by whom it is fed and protected, and allows them to stroke it on the head and throat, appearing to take pleasure in their caresses.

In feeding it commonly seizes its food with both hands, and then consigns it to one, sitting upright on its haunches and generally suspended by its hinder paws to eat it. When a small live animal is placed within its reach, it relaxes its hold with its fore paws, and seizing its victim with more rapidity than might be expected from its ordinary habits, destroys it with much dexterity, and soon deposits the carcase in its stomach devouring the bones as well as the flesh, but rejecting the feathers of birds which it previously plucks off. It is probable that in a state of nature it lives almost wholly upon the trees, prowling abroad at night, and preying upon sleeping birds, insects and mice, which it approaches unawares and seizes before they are sufficiently roused to notice its proximity ; they would otherwise readily make their escape from an animal so tardy in its motions. When it fails in procuring these, it may have recourse to fruits, on which alone it thrives very well in captivity.

The Lemurs are all natives of Madagascar and of one or two smaller islands in its neighbourhood. We know but little of their habits in a state of nature, but they are said to live in large bands upon the trees feeding principally upon fruits ; and this conformation renders this account extremely probable. They are almost equally agile with the monkeys ; but are much more gentle and peaceable in their dispositions. In captivity they are generally good-tempered, but do not usually exhibit much playfulness or intelligence. After a time they become familiar with those who have the care of them, towards whom they will sometimes evince a considerable degree of affection. Fruits and roots form the principal part of their nutriment ; but dressed meat or even raw fish appear to be no unwelcome additions to their vegetable diet. Notwithstanding the thickness of their coats they are extremely chilly, and are very fond of basking in the sun or crouching by the fireside. In walking or leaping they usually raise their long bushy tails above the level of their backs ; but when at rest they either suffer them to hang down, or coil them around their bodies to retain the warmth.

In the red Lemur the general colour of the upper surface of the body is of a bright rufous brown, and that of the under parts of a deep black. The former includes the sides of the face, the ears, the back and sides, and the outer surface of the limbs ; the latter, the forehead, the naked face itself, the throat, breast, and abdomen, the inside of the limbs, and the entire feet with the exception of a narrow stripe of white passing across the upper surface of the hinder ones. The tail is perfectly black throughout. A large oval patch of white occupies the back of the neck, extending from behind the ears to between the shoulders, and separating the black of the head from the red of the back. Upwards of a dozen species of lemurs have been described, but their differences have not yet been satisfactorily ascertained.

OF THE OPOSSUM, AND ITS KINDS.*

To these four-handed animals of the ancient continent, we may add the four-handed animals of the new, that use their hands

* Pouched animals were known at first only in America; all the species found on that continent agree so completely in general organization, as well as in this peculiar conformation of the genitals, that Linnæus found in them the elements of a single genus, which he called *Didelphis* or double wombed.

Afterwards from the East Indies, and still later from the regions of Australasia, animals arrived equally distinguished by the possession of the abdominal pouch; these were immediately set down as genuine *Didelphes*, and Gmelin has bestowed on them the titles of *Didelphis Orientalis*, *Didelphis Brunii*, &c.; and even the *Tarsier* of Daubenton he inscribed among them, under the name of *Didelphis Macrotarsus*. None, however, of these animals answered to the definition of Linne; all had less than six incisors above, and less than eight below, &c.: nevertheless, Fallas, Camper, and Zimmerman still preserved the appellation of Gmelin, and thus prolonged the abuse.

At first an opinion arose that the young of these animals were actually produced in the abdominal pouch beside the mammae of the mother. It is nearly two centuries since Maregrave has said, "The pouch is properly the matrix of the Carigueya (*Didelphis Opossum*). I have been unable to find any other; this is a point which I have ascertained by dissection. The semen is produced there, and the young are formed." Pison confirms the same facts, having, as he observes, dissected many of the carigueyas. Valentyn, makes the same assertion, in his account of the Molucca Islands: "The pouch of the philanders is a matrix in which the young are conceived. This pouch is not what is usually supposed. The mammae are, with regard to the young, what stalks are to their fruits." The young remain attached to the mammae, until they have attained maturity, and then separate from them as the fruit drops from the stalk.

These notions are also common in Virginia, even among physicians. Beverly says, that the young opossum exists in the false belly, without ever entering the true, and are developed on the teats of the mother. The Marquess of Chastellux makes a similar remark. Hence Pennant says, "That suspended to the mammae of the mother, they remain there at first without motion: this lasts until they have acquired some development and strength; but then they undergo a second birth."

Two opossums, (*Didelphis Virginiana*), male and female, were domesticated in the house of M. d'Aboville, in 1783; these animals copulated, and the effects were attentively observed by that gentleman: in about ten days the edge of the orifice of the pouch grew thicker, a phenomenon which afterwards grew more perceptible. As the pouch increased in size, the orifice widened. On the thirteenth day, the female did not quit her retreat except to eat, drink, and evacuate: on the fourteenth she did not stir from it. M. d'Aboville then determined to seize and examine her: the pouch, the aperture of which had widened before, was now nearly closed; a slimy

like the former, as well as their tails, and that fill up the chasm between the monkey tribe and the lower orders of the forest. As the maki kind in some measure, seem to unite the fox and the monkey in their figure and size, so these seem to unite the

secretion moistened the hairs on its circumference. On the fifteenth day, a finger was introduced into the pouch, and a round body about the size of a pea was plainly felt at the bottom. This examination was made with difficulty, on account of the impatience of the mother, who had before this been always very mild and tranquil. On the seventeenth, she permitted a further examination, and M. d'Aboville discovered two bodies about the size of a pea. There was, however, a great number of these young ones. On the twenty-fifth day, they moved very perceptibly, yielding to the touch: on the fortieth, the pouch was sufficiently open for them to be plainly distinguished; and on the sixtieth, when the mother lay down, they were seen hanging to the teats, some outside the pouch, some inside. The nipple is about two-eighths of an inch in length; but it soon dries up, and at last drops off, after the manner of the umbilical cord.

M. Geoffroy, lamenting the vagueness and obscurity existing on the subject of pouched animals, wrote an article in 1819, with this query as title, "Are the pouched animals born attached to the teats of the mother?" His object was to call the attention of scientific men to the subject, and more especially of those who possess the means of investigation in those countries which form the habitat of the animals. His observations are highly interesting and important. On the pouch, he remarks that it is not in the adult female, a cavity of equal capaciousness at all times. M. d'Aboville observed it to increase in magnitude under the influence of the phenomena of generation, and M. Geoffroy himself has observed its relative dimensions in females of the same species. It is small previous to sexual intercourse, large to excess when the young ones are about to drop from the mammæ, and of a moderate size in the period immediately following. Thus the pouch cannot be considered merely as a *second domicile*, without spring or activity; it is a true place of incubation, extending by degrees, acquiring more and more volume, as happens to every other *domicile* of the fœtus. Well, therefore, might it be called a second uterus, and the most important of the two.

As to the mode in which the young are placed in the external pouch, or rather attached to the nipple, nothing is accurately known. A communication between the external uterus and this pouch has been asserted to exist, but never demonstrated. Some have imagined that the mother placed the young there herself with her hands and feet; but this is not very likely. Another opinion was, that the pouch extended to the orifice of the vagina; but the muscles do not seem disposed for such an arrangement, and some species have no pouch.

Pouched animals derive their appellation of *Marsupiated*, or, as some call them, *Marsupiales*, from the character of the pouch. It may, however, be well questioned, whether as a generic or classic term, it be unobjectionable. There are many species in which this character of the pouch does not exist, while, on the contrary, there are none without the double matrix, which would render the Linnæan appellation of *Didelphis* more universally suit-

monkey and the rat. They are all less than the former; they have long tails, almost bare of hair; and their fur, as well as their shape, seems to place them near the rat kind. Some have accordingly ranked them in that class; but their being four-

able to all the species. Be that as it may, the marsupia are unquestionably the most singular of all known quadrupeds. With the exception of the peculiarities of their generation, there is scarcely any character in common among them. The organs of locomotion and digestion vary considerably, and that in a manner so nicely graduated, that all the shades between the Carnassiers, properly so called, and the genuine rodentia, are discoverable among the animals in question by the character of the teeth. Their extremities are equally modified from those which are designed to dig the earth, to those adapted for climbing with the utmost facility the loftiest trees.

The feet among some, as the phascolomys, are calculated for digging in the ground. In this case, there are five toes armed with powerful nails on the fore feet, and four only on the hinder, with a small tubercle instead of thumb. With others (as the Kangaroos, Potoroos, and Perameles) the hinder feet are conformed for the execution of rapid leaps; and then they have but four toes, the second of which is very strong, longer than the others, and furnished with a nail almost as thick as a hoof. The two internal ones are small and connected. The metatarsus is very long, as well as the limb to which it belongs. The fore-paws are very short, and terminated by five toes furnished with tolerably long talons. In the phalangers, which are eminent climbers, the posterior thumb is considerably separated, and without a claw; the two toes which immediately follow it, are connected by the skin as far as the last phalanx. The toes of the fore-feet differ little from those of the common carnassiers, while in the koala these same toes are divided into two groups for the act of seizing; the thumb and index being on one side, and the three others on the opposite. The four hinder toes are connected two by two, and very distinct from the thumb. In the dasyuri, which run upon the ground like the martens, the fore-feet have five toes, and the hinder four, all separated and armed with curved claws, while the hinder thumb is but a simple tubercle. Finally, the didelphes which climb trees have toes like the dasyuri, except that the posterior thumb is distinct, and without a nail like that of the phalangers. The chironectes which swim, differ from the didelphis, only in having the hinder feet palmate. There is no tail in the phascolomys. In the koalas it is a simple tubercle, but considerably long in all the other genera. In the didelphes, the chironectes, and the true phalangers, it is naked, scaly, and prehensile. In the kangaroos and potoroos, it is strong, triangular, and conic, and concurs to locomotion with the long hinder limbs. The isoodonta and the perameles have it of the same form, but much less robust. Finally, the dasyuri, and particularly the flying phalangers, have it much elongated, and more or less tufted. In the petauristæ alone, we find the skin of the sides extended between the fore and hind legs, serving as a parachute after the manner of the galeopitheci and polatouches. The crab-eating didelphis, the kangaroo, the perameles, the isoodon, the potoroo, the phalangers, the petauristæ, and the phascolomys alone, have the ventral pouch which has given a denomination to the entire tribe. In the rest the mammæ are visible without,

handed is a sufficient reason for placing them in the rear of the monkeys.

The first, and the most remarkable of this tribe is the OP-
OSSUM, an animal found both in North and South America, of

and some have on each side the fold of skin which forms the pouch, but scarcely visible. The number of the mammæ vary, and is especially considerable among the didelphes.

The physiognomy of these animals is in relation to their natural habits and mode of living. The didelphes and dasyuri have a conic head, elevated ears, mouth deeply cut, and the aspect of carnivora. The perameles rather resemble rats, the long-legged kangaroos, hares, and the phascalomys the marmot. Some, such as the didelphis and dasyuri, are carnassiers, living on eggs, small birds, and corrupted flesh, and sometimes crustacea and insects. Others, as the kangaroo and phascalomys, are sustained purely on vegetables. The phalangiers are probably both frugivorous and insectivorous.

They are all remarkable for the imperfect development in which the young are born. Even in the species without pouches, and with prehensile tails, the young hang under the belly of the mother for a certain time; then they mount on her back, and twist their tails round hers to fix themselves. The young of the koala, which has no tail, fixes itself on the parent's back, and fastens there with its hands. The number of the young is variable. In the didelphes, from ten to twelve, and in the kangaroo, usually but one.

The marsupiata are generally solitary. Some remain constantly on the trees, the didelphes, the phalangiers, and koalas. Others ferret continually in the rocks on the seashore, as the dasyuri. Others remain constantly at the bottom of their burrows (the phascalomys). The kangaroos, feeble animals, and without means of defence, live in troops. They alone serve for the purposes of nourishment to man, whom they avoid only by means of that activity with which they execute such rapid and extended leaps. Their skins are the only clothing worn by the natives of those countries which they inhabit.

A very remarkable fact is, that the marsupiata have, as yet, been observed only in South America, New Holland, and some islands of the Indian Archipelago. The didelphes, properly so called, or the sarigues, and the chironectes, are proper to the first of these countries. All the others, except the phalangiers, with naked and scaly tails, are peculiar to the second; and those last mentioned phalangiers, and a species of the kangaroo, are alone to be met with in the Indian Archipelago. It is remarkable that all the mammalia known in New Holland, to the present day, with the exception of the dog, and the hydromys with white belly and that with yellow, belong to the marsupiata. To this continent also belong the ornithorhynchi and echidnæ, which have also the marsupial bones in both sexes, but whose organs of generation are peculiarly conformed, and in which no mammæ have yet been observed. These animals have so great an analogy with the marsupiata, that M. De Blainville puts them in the same sub-class. But M. Geoffroy has separated them from the other mammalia, to form an order which he calls MONOTREMES.

The Virginian opossum is an animal by no means eminent for intelligence. It digs a burrow or den, near thickets not too far removed from the habi-

the size of a small cat. The head resembles that of a fox; it has fifty teeth in all, but two great ones in the midst like those of a rat. The eyes are little, round, clear, lively, and placed upright; the ears are long, broad, and transparent, like those of the rat kind; its tail also increases the similitude, being round,

tations of men, and sleeps there the live-long day. Seeing but badiy while the sun is above the horizon, it is in the night that it proceeds in search of food, and of the female during the season of its amours. It mounts trees, penetrates into farm-yards, attacks the small birds and poultry, sucks their blood, devours their eggs, and then returns to conceal itself at the bottom of its retreat. It frequently contents itself with reptiles and insects, and fruits occasionally form a portion of its food. Though its mode of life is very analogous to that of the foxes and weasels, it is considerably less sanguinary and cruel. The opossums are also much worse provided with the means of defence, than these animals. They run badly, and though their mouth is extremely large and well furnished with teeth, yet it is deficient in strength, and they are wanting in that intelligence which might render it an efficient weapon against their enemies. They attempt to bite the stick which strikes them, but not the arm which guides it; very different in this respect from most other mammalia, which, by a very remarkable act of intelligence, distinguish the person from the instrument which he uses, and invariably attack the former. Their chief resource of defence seems to consist in the disagreeable odour which they exhale when they find themselves in danger. M. D'Azara, who speaks of it from experience, declares it to be really insupportable. All their desires seem feeble, even that of re-production.

The species of the sarigues are inter-distinguished from the opossum by shades of difference so very easy to confound, that the character may be lost by the slightest negligence.

The *Cayopollin*, or Mexican Opossum, is about eight inches long, and the tail is about a foot. The muzzle is inclining to be thick, and the ears are rather large. The eyes are slightly bordered with blackish. It is marked in the frontal ridge with a longitudinal line of brown, grayish on the edges. All the upper and external parts are of a fawn colour and gray intermingled, the summit of the hairs being of the former, and the rest of them of the latter colour. The fawn colour predominates on the occiput and the neck. The rest of the animal is of a very pale and almost whitish yellow. The ears are naked at their internal face. The tail is covered with hairs for something more than an inch from its origin, and the rest with scales, intermingled with some brush hairs. Part of the tail is variegated with brown and yellow, the point being of this last colour.

The *Touan*, or short-tailed Opossum (*D. Tricolor vel brachyura*), is something more than five inches, and the tail a little more than an inch. Its ears are of moderate size, naked, and of a rounded form. The tail is very short in comparison of the other species of this genus; hairy at the base, and naked and scaly for the rest of its extent. Upper part of the body, back of the head, and hairs on the basis of the tail, blackish. Cheeks, shoulders, flanks, throat, external side of the thighs and paws of a lively red. The breast and under part of the body of a pure white.

There are other species of didelphes enumerated by naturalists.

long, a little hairy in the beginning, but quite naked towards the end. The forelegs are short, being about three inches long; while those behind are about four. The feet are like hands, each having five toes or fingers with white crooked nails, and rather longer behind than before. But it is particular in this animal, that the thumb on the hinder legs wants a nail; whereas the fingers are furnished with clawed nails as usual.

But that which distinguishes this animal from all others, and what has excited the wonder of mankind for more than two centuries, is the extraordinary conformation of its belly, as it is found to have a false womb, into which the young, when brought forth in the usual manner, creep, and continue for some days longer, to lodge and suckle securely. This bag, if we may so call it, being one of the most extraordinary things in natural history, requires a more minute description. Under the belly of the female is a kind of slit or opening, of about three inches long; this opening is composed of a skin, which makes a bag internally, that is covered on the inside with hair, and in this bag are the teats of the female; and into it the young, when brought forth, retire either to suckle or to escape from danger. This bag has a power of opening and shutting, at the will of the animal; and this is performed by means of several muscles, and two bones, that are fitted for this purpose, and that are peculiar to this animal only. These bones are placed before the *os pubis*, to which they are joined at the base; they are about two inches long, and grow smaller and smaller to their extremities. These support the muscles that serve to open the bag, and give them a fixtured. To these muscles there are antagonists, that serve in the same manner to shut the bag; and this they perform so exactly, that in the living animal the opening can scarcely be discerned, except when the sides are forcibly drawn asunder. The inside of this bag is furnished with glands that exude a musky substance, which communicates to the flesh of the animal, and renders it unfit to be eaten. It is not to be supposed that this is the place where the young are conceived, as some have been led to imagine; for the opossum has another womb, like that of the generality of animals, in which generation is performed in the ordinary manner. The bag we have been describing may rather be considered as a supplemental womb. In the real womb, the little animal is partly brought to perfection; in the

ordinary one, it receives a kind of additional incubation ; and acquires, at last, strength enough to follow the dam wherever she goes. We have many reasons to suppose that the young of this animal are all brought forth prematurely, or before they have acquired that degree of perfection which is common in other quadrupeds. The little ones, when first produced, are in a manner but half completed ; and some travellers assert, that they are at that time not much larger than flies. We are assured also, that immediately on quitting the real womb they creep into the false one ; where they continue fixed to the teat, until they have strength sufficient to venture once more into the open air, and share the fatigues of the parent. Ulloa assures us, that he has found five of these little creatures hidden in the belly of the dam three days after she was dead, still alive, and all clinging to the teat with great avidity. It is probable, therefore, that upon their first entering the false womb, they seldom stir out from thence ; but when more advanced, they venture forth several times in the day, and at last seldom make use of their retreat, except in cases of necessity or danger. Travellers are not agreed in their accounts of the time which these animals take to continue in the false womb ; some assure us they remain there for several weeks ; and others, more precisely, mention a month. During this period of strange gestation there is no difficulty in opening the bag in which they are concealed ; they may be reckoned, examined, and handled, without much inconvenience ; for they keep fixed to the teat, and cling there as firm as if they made a part of the body of the animal that bears them. When they are grown stronger, they drop from the teat into the bag in which they are contained ; and at last find their way out, in search of more copious subsistence. Still, however, the false belly serves them for a retreat, either when they want to sleep or to suckle, or when they are pursued by an enemy. The dam, on such occasions, opens her bag to receive them, which they enter,

—Pars formidine turpi
Scandunt rursus equum et nota conduntur in alvo.

The opossum, when on the ground, is a slow, helpless animal ; the formation of its hands are alone sufficient to show its incapacity of running with any degree or swiftness ; but, to counterbalance this inconvenience, it climbs trees with great ease

and expedition.¹ It chiefly subsists upon birds; and hides among the leaves of the trees to seize them by surprise. It often also hangs by the tail, which is long and muscular; and in this situation, for hours together, with the head downwards, it keeps watching for its prey. If any lesser animal, which it is able to overcome, passes underneath, it drops upon it with deadly aim, and quickly devours it. By means of its tail,¹ the opossum also slings from one tree to another, hunts insects, escapes its pursuers, and provides for its safety. It seems to be a creature that lives upon vegetables, as well as animal substances, roots, sugarcanes, the bark, and even the leaves of trees. It is easily tamed, but, it is a disagreeable domestic, as well from its stupidity and figure as its scent, which, however fragrant in small quantities, fails not to be ungrateful when copiously supplied.*

An animal greatly resembling the former,² is the MARMOSE, which is found in the same continent. It seems only to differ in size, being less; and, instead of a bag to receive its young, has only two longitudinal folds near the thighs, within which the young, which are prematurely brought forth, as in the last instance, continue to suckle. The young of these, when first produced, are not above the size of a bean; but continue sticking to the teat, until they have arrived at greater maturity.

The CAYOPOLIN is somewhat larger than the former, and a good deal resembling it in habits and figure, except that its snout is more pointed, its tail longer in proportion, and its colour different, being of an ash, somewhat inclining to yellow; however, I should suppose it to be only a variety of the former.

To this number we may add the PHILANGER, so called by Mr Buffon; a good deal resembling the former, but distinguished by the fashion of its hinder hands; the thumb and fore-finger being joined together, except at the extremities.† This animal is about

¹ Buffon, vol. xxi. p. 174.

* An animal nearly allied to the Opossum is the Kangaroo of New Holland, which will be found described in a succeeding chapter.

² Buffon, vol. xxi. p. 212.

† It was in consequence of this union that these mammalia received the name of Phalangiers, from Buffon and Daubenton. It was a remarkable character at the epoch in which those writers flourished, and they named from it the only species then known to exhibit it. Since that period, however, it has been found in many other genera.

These animals live almost continually in trees, where they subsist on

the size of a rat, and has, accordingly, by some, been called the RAT OF SURINAM.

The last animal of this class is called, by Mr Buffon, the TARSIER. This extraordinary little animal resembles the former, in having four hands, and a long tail: but it differs very much in the extreme length of its hinder legs, which are longer than the rest of its whole body. The bones of that part of the foot called the *tarsus*, are likewise so very long, that from thence

fruits and insects. They are slow in their movements, and emit an unpleasant odour, which proceeds from a liquor secreted in a gland observable near the anus. The phalangers are found in the Moluccas, New Holland and Van Dieman's Land.

The Vulpine Phalanger (Didelphis Vulpina), is about the size of a large cat. The general proportions of its body are elegant and delicate, more so than those of the other phalangers. The upper part and sides of the body, as well as the basis of the tail, are grayish brown, approaching to fawn-colour on the shoulders. The head is of a grayish fawn, deeper than that of the belly. The ears are naked within, and covered with gray and fawn coloured hairs without. The external side of the limbs are rather of a more obscure colour than the back. The tail is covered with hair in its entire extent, with the exception of a narrow band placed underneath, which commences about the middle, and continues to the point. The skin which covers this band is slightly granulated. The hairs of the tail are long, and of a very fine black, except at the base, where they are of the same colour as the back.

According to Mr Rollin, surgeon of our naval establishment at Port Jackson, this phalanger lives in burrows, subsists on small prey, and chases the birds like didelphes. Its habitat is the eastern coast, in the environs of Port Jackson.

The Phalanger of Cook, (Phalangista Cookii), is about one foot two or three inches long. The tail is nearly equal in length to the whole body. The upper part of the body of a reddish grey. The under part white under the chin and on the upper lip. Throat marked with a brownish spot. The ears are covered externally with greyish-red hairs. The cheeks are marked with a small white spot, scarcely visible behind the eye. The tail is reddish at the base, then brown, and the extremity covered with white hairs. Habitat,—Van Dieman's Land.

The second tribe of the phalangers, of which some naturalists make a genus, is the PETAURISTÆ, or FLYING PHALANGERS.

The most peculiar character of the petauristæ is an extension of the skin of the sides, whereby the anterior and posterior extremities are united, and a kind of parachute rather than a wing is formed. There is a spacious ventral pouch in the females.

The tail is very long, not prehensile; is furnished with hair; is sometimes round, sometimes flat. The habits of these animals are pretty similar to those of the phalangers we have last noticed. They jump with tolerable activity from branch to branch, and are enabled to sustain themselves for a little time in the air by the assistance of their parachute. They are nocturnal animals, and are found in New Holland and the Island of Norfolk.

the animal has received its name : the tail is naked in the middle, and hairy only at both extremities : its hair is woolly, soft, and of a deep ash-colour. As to the rest, it is unknown from what country this animal was brought ; but the naturalist from whom we have its description, supposes it to be a native of America.

From this general description of four-handed animals, we perceive what few advantages the brute creation derive from those organs, that, in man, are employed to so many great and useful purposes. The being able to pluck their food from the trees, the capacity of clinging among the branches, and at most of converting one of those branches, into a weapon of offence, are the highest stretches of their sagacity, and the only use their hands have hitherto been employed in ; and yet some superficial men have asserted, that the hands alone are sufficient to vindicate the dominion of mankind over other animals ; and that much of his boasted reason, is nothing more than the result of his happier conformation : however, were this so, an ape or a monkey would, in some instances, be more rational than we ; their fingers are smaller, and, in some of them, more finely formed than ours. To what a variety of purposes might they not be employed, if their powers were properly exerted ! Those works which we, from the largeness of our fingers, are obliged to go clumsily about, one of these could very easily perform with the utmost exactness ; and if the fineness of the hand assisted reason, an ape would be one of the most reasonable beings in the creation. But these admirably formed machines, are almost useless both to mankind and themselves ; and contribute little more to the happiness of animal life than the paws of the lowest quadruped. They are supplied, indeed, with the organs ; but they want the mind to put them into action : it is that reasoning principle alone, with which man has been endowed, that can adapt seemingly opposite causes to concur in the same general design ; and even where the organs are deficient, that can supply their place, by the intervention of assisting instruments. Where reason prevails, we find that it scarcely matters what the organs are that give it the direction ; the being furnished with that principle still goes forward steadily, and uniformly successful ; breaks through every obstacle, and becomes master of every enterprise. I have seen a man without hands or legs convert, by practice, his very stumps to the most convenient purposes ; and with these

clumsy instruments perform the most astonishing feats of dexterity. We may, therefore, conclude that it is the mind alone that gives a master to the creation ; and that, if a bear or a horse were endowed with the same intellects that have been given to man, the hardness of a hoof, or the awkwardness of a paw, would be no obstacle to their advancement in the arts of dominion, or of social felicity.

CHAP. II.

OF THE ELEPHANT.

HAVING gone through the description of those quadrupeds that, by resembling each other in some striking particular, admit of being grouped together, and considered under one point of view, we now come to those insulated sorts that bear no similitude with the rest, and that to be distinctly described must be separately considered.

The foremost of these, and in every respect the noblest quadruped in nature, is the Elephant, not less remarkable for its size than its docility and understanding. All historians concur in giving it the character of the most sagacious animal next to man ; and yet, were we to take our idea of its capacity from its outward appearance, we should be led to conceive very meanly of its abilities. The elephant, at first view, presents the spectator with an enormous mass of flesh that seems scarcely animated. Its huge body covered with a callous hide, without hair ; its large mis-shapen legs, that seem scarcely formed for motion ; its little eyes, large ears, and long trunk ; all give it an air of extreme stupidity. But our prejudices will soon subside when we come to examine its history ; they will even serve to increase our surprise, when we consider the various advantages it derives from so clumsy a conformation.

The elephant is seen from seven to no less than fifteen feet high.* Whatever care we take to imagine a large animal before-

* Elephants very rarely exceed ten feet in height. Seven feet and upwards is the East India Company's standard for serviceable elephants, measured at the shoulder, as horses are. A large elephant weighs from six to seven thousand pounds.

hand, yet the first sight of this huge creature never fails to strike us with astonishment, and in some measure to exceed our idea. Having been used to smaller animals, we have scarcely any conception of its magnitude ; for a moving column of flesh, fourteen feet high, is an object so utterly different from those we are constantly presented with, that to be conceived it must be actually seen. Such, I own, were the suggestions that naturally arose to me when I first saw this animal, and yet for the sight of which I had taken care to prepare my imagination. I found my ideas fall as short of its real size as they did of its real figure ; neither the pictures I had seen, nor the descriptions I had read, giving me adequate conceptions of either.

It would, therefore, be impossible to give an idea of this animal's figure by a description ; which, even assisted by the art of the engraver, will but confusedly represent the original. In general, it may be observed, that the forehead is very high and rising, the ears very large and dependent, the eyes extremely small, the proboscis or trunk long, the body round and full, the back rising in an arch, and the whole animal short in proportion to its height. The feet are round at the bottom ; on each foot there are five flat horny risings, which seem to be the extremities of the toes, but do not appear outwardly. The hide is without hair, full of scratches and scars, which it receives in its passage through thick woods and thorny places. At the end of the tail there is a tuft of hair, a foot and a half long. The female is less than the male, and the udder is between the fore-legs. But a more accurate, as well as a more entertaining description of the parts, will naturally occur in the history of their uses. *

* There are two species of elephant—the Asiatic and African. *The Asiatic Elephant* is distinguished from its African congener, principally by the character of the teeth ; the head moreover is oblong, the forehead concave, and the ears do not descend lower than the neck. This species is found in the whole of Southern India, and in the neighbouring islands. Though so extensively employed by man, it can hardly be considered a domestic animal, as it is not bred in captivity ; but when a fresh supply is wanted for general purposes, they are hunted or rather sought for in their sequestered retreat, and after being captured, are quickly reduced to servitude. Taking and taming wild elephants is an affair of great moment in India, a description of which, however amusing, we feel constrained to forego.

A strong elephant can carry 2000 pounds weight, and can travel without difficulty fifty miles in a day ; in long marches, however, they become very tender-footed, as may be seen by their gait, and by their feeling with the

Of all quadrupeds, the elephant is the strongest, as well as the largest; and yet, in a state of nature, it is neither fierce nor formidable.¹ Mild, peaceful, and brave, it never abuses its power or its strength, and only uses its force for its own protection, or that of its community. In its native deserts, the elephant is seldom seen alone, but appears to be a social, friendly creature. The oldest of the company conducts the band; that which is next

proboscis on the ground where they are about to tread for a footfall without stones or sharp rocks, otherwise they are very nimble for their bulk, walk up and down footways into ravines where camels cannot pass, and where horses find difficulty.

The period of gestation is twenty months; the new-born elephant is about three feet long, and all its senses are perfect: it sucks with the mouth and not with the proboscis, turning the latter back in that operation. Lactation continues nearly two years, and between fifteen and twenty years old they may be said to be adult: though they have a great affection for their young, it is understood that these suck indifferently all the females in the herd to which they belong. They are gregarious, in herds of about 100, and inhabit the humid forests and vicinity of rivers, in which they swim with great ease, sometimes having no part above the surface of the water but the end of the proboscis through which they respire. When they quit the water they are fond of collecting the soil and dust with the proboscis, and covering their body with it.

Though gregarious in their habits, solitary wild elephants are sometimes met with, but these are always observed to be males, and are in general extremely furious, attacking every thing they meet, and doing the greatest damage. It seems probable that these have been driven by stronger rivals from the herd.

It is the opinion in India that they live three centuries, and several now in the service of the East India Company were old when they came into possession of the Europeans upwards of eighty years ago. These old animals, however, dislike to rise from the ground, and are at first unwilling to move forward, piping an angry note of dissent.

It appears probable, though it is not determined, that there may be more than one variety of the Asiatic elephant distinguished by the size of the tusks; those of the females are in general less than those of the males. These tusks weigh sometimes as much as 150 pounds the pair.

The African Elephant is distinguished by a round or cylindrical head, with the face more protruded than in the Asiatic species, a convex forehead and enormous ears, which descend as far as the legs. They are indeed so large, that at the Cape they make sledges of them to draw the heavy tools to and from the field, and even convey the sick. The peculiarity of the cheek-teeth before noticed also separates it, and there is reason to think that three toes only of the hind feet have nails. The tusks are said to be of equal size both in the male and female of this species, and the eyes are situate lower, nearer the mouth, and more forward in the African elephant than in its Asiatic congener.

I have extracted the greatest part of this description from Mr Buffon. Where I add, I mark with commas, "thus."

in seniority brings up the rear. The young, the weak, and the sickly, fall into the centre ; while the females carry their young, and keep them from falling by means of their trunks. They maintain this order only in dangerous marches, or when they desire to feed in cultivated grounds ; they move with less precaution in the forests and solitudes ; but without ever separating, or removing so far asunder as to be incapable of lending each other any requisite assistance. Nothing can be more formidable than a drove of elephants, as they appear at a distance in an African landscape ; wherever they march, the forests seem to fall before them ; in their passage, they bear down the branches upon which they feed ; and if they enter into an inclosure, they destroy all the labours of the husbandman in a very short time. Their invasions are the more disagreeable, as there is no means of repelling them ; since it would require a small army to attack the whole drove when united. It now and then happens that one or two is found lingering behind the rest, and it is against these that the art and force of the hunters are united ; but an attempt to molest the whole body would certainly be fatal. They go forward directly against him who offers the insult, strike him with their tusks, seize him with their trunks, fling him into the air, and then trample him to pieces under their feet. But they are thus dreadful only when offended, and do no manner of personal injury when suffered to feed without interruption. It is even said that they are mindful of injuries received ; and when once molested by man seek all occasions for the future to be revenged ; they smell him with their long trunks at a distance ; follow him with all their speed upon the scent ; and though slow to appearance they are soon able to come up with and destroy him.

In their natural state they delight to live along the sides of rivers, to keep in the deepest vales, to refresh themselves in the most shady forests and watery places. They cannot live far from the water ; and they always disturb it before they drink. They often fill their trunk with it either to cool that organ, or to divert themselves by spurting it out like a fountain. They are equally distressed by the extremes of heat and cold ; and to avoid the former, they frequently take shelter in the most obscure recesses of the forest, or often plunge into the water, and even swim from the continent into islands some leagues distant from the shore.

Their chief food is of the vegetable kind, for they loathe all kind of animal diet. When one among their number happens to light upon a spot of good pasture, he calls the rest, and invites them to share in the entertainment; but it must be very copious pasture indeed that can supply the necessities of the whole band. As with their broad and heavy feet they sink deep wherever they go, they destroy much more than they devour; so that they are frequently obliged to change their quarters, and to migrate from one country to another. The Indians and negroes, who are often incommoded by such visitants, do all they can to keep them away, making loud noises, and large fires round their cultivated grounds: but these precautions do not always succeed; the elephants often break through their fences, destroy their whole harvest, and overturn their little habitations. When they have satisfied themselves, and trod down or devoured what ever lay in their way, they then retreat into the woods in the same orderly manner in which they made their irruption.

Such are the habits of this animal, considered in a social light; and if we regard it as an individual, we shall find its powers still more extraordinary. With a very awkward appearance, it possesses all the senses in great perfection, and is capable of applying them to more useful purposes than any other quadruped. The elephant, as we observed, has very small eyes, when compared to the enormous bulk of its body. But though their minuteness may at first sight appear deformed, yet, when we come to examine them, they are seen to exhibit a variety of expression, and to discover the various sensations with which it is moved. It turns them with attention and friendship to its master; it seems to reflect and deliberate; and as its passions slowly succeed each other, their various workings are distinctly seen.

The elephant is not less remarkable for the excellence of its hearing. Its ears are extremely large, and greater in proportion than even those of an ass. They are usually dependent; but it can readily raise and move them. They serve also to wipe its eyes, and to protect them against the dust and flies that might otherwise incommode them. It appears delighted with music, and very readily learns to beat time, to move in measure, and even to join its voice to the sound of the drum and the trumpet.

This animal's sense of smelling is not only exquisite, but it is in a great measure pleased with the same odours that delight

mankind. The elephant gathers flowers with great pleasure and attention ; it picks them up one by one, unites them into a nose-gay, and seems charmed with the perfume. The orange-flower seems to be particularly grateful, both to its sense of taste and smelling ; it strips the tree of all its verdure, and eats every part of it, even to the branches themselves. It seeks in the meadows the most odoriferous plants to feed upon ; and in the woods it prefers the cocoa, the banana, the palm, and the sago tree, to all others. As the shoots of these are tender, and filled with pith, it eats not only the leaves and the fruits, but even the branches, the trunk, and the whole plant to the very roots.

But it is in the sense of touching that this animal excels all others of the brute creation, and perhaps even man himself. The organ of this sense lies wholly in the trunk, which is an instrument peculiar to this animal, and that serves it for all the purposes of a hand. The trunk is, properly speaking, only the snout lengthened out to a great extent, hollow like a pipe, and ending in two openings or nostrils like those of a hog. An elephant of fourteen feet high has the trunk about eight feet long, and five feet and a half in circumference at the mouth where it is thickest. It is hollow along, but with a partition running from one end of it to the other ; so that though outwardly it appears like a single pipe, it is inwardly divided into two. This fleshy tube is composed of nerves and muscles, covered with a proper skin of a blackish colour, like that of the rest of the body. It is capable of being moved in every direction, of being lengthened and shortened, of being bent and straightened ; so pliant as to embrace any body it is applied to, and yet so strong that nothing can be torn from the gripe. To aid the force of this grasp, there are several little eminences, like a caterpillar's feet, on the underside of this instrument, which without doubt contribute to the sensibility of the touch, as well as to the firmness of the hold. Through this trunk the animal breathes, drinks, and smells, as through a tube ; and at the very point of it, just above the nostrils, there is an extension of the skin, about five inches long, in the form of a finger, and which in fact answers all the purposes of one ; for with the rest of the extremity of the trunk, it is capable of assuming different forms at will, and consequently of being adapted to the minutest objects. By means of this, the elephant can take a pin from the

ground, untie the knots of a rope, unlock a door, and even write with a pen. "I have myself seen," says Ælian, "an elephant writing Latin characters on a board, in a very orderly manner, his keeper only showing him the figure of each letter. While thus employed, the eyes might be observed studiously cast down upon the writing, and exhibiting an appearance of great skill and erudition." It sometimes happens that the object is too large for the trunk to grasp; in such a case the elephant makes use of another expedient, as admirable as any of the former. It applies the extremity of the trunk to the surface of the object, and, sucking up its breath, lifts and sustains such a weight as the air in that case is capable of keeping suspended. In this manner this instrument is useful in most of the purposes of life; it is an organ of smelling,* of touching, and of suction; it not only pro-

* Cuvier considers that the trunk is not in itself an organ of smell, but that the sense of smell is confined to that part of the nostrils which is inclosed in the bones of the head. As an organ of touch, the proboscis of the elephant is exquisitely fine. Elephants sometimes go blind; and under that privation, the poor animal can not only collect its food, and discriminate as to its quality, by this wonderful instrument, but can travel without much difficulty, over unequal ground, avoiding lumps and hollows, and stepping over ditches. The creature, under such circumstances, rarely touches the ground with its trunk; but projecting it forward as far as possible, lets the finger, which is curled inward to protect the nostrils, skim along the surface, to the inequalities of which this organ adjusts itself with wonderful exactness.

The great care of the elephant, whether he be in a state of nature, or under the control of man is, invariably to put his trunk out of harm, as far as he can, when any danger presents itself. If he is attacked by a tiger, or any other wild animal, he carries his trunk as high as he can in the air, and if this delicate organ be in the slightest degree injured, the elephant becomes wild with rage and terror. He is even afraid of a dead tiger, and carefully puts his trunk out of reach. The instinct by which the creature defends and preserves this precious instrument, is in proportion to its paramount importance. Mr Williamson saw an elephant whose trunk had been cut through with a bill-hook; and though the wound was healed, the animal was perfectly helpless—unable to supply its own food, and incapable even of travelling without danger. He was fed with bundles of grass which were put into his mouth; had he been in a state of nature, he must have perished. An affecting example of the instinct with which the elephant preserves his trunk, is exhibited in the death of the poor animal who was burned at Dublin. The author of the anatomical account says—"Doubtless the elephant's care to preserve the proboscis was great; for when we dissected him, we found it thrust near two feet into a very hard ground; upon which account we thought it had been burned, till the head was divided from the body, and then we found it kept fast to the ground by the proboscis." The

vides for the animal's necessities and comforts, but it also serves for its ornament and defence.

But though the elephant be thus admirably supplied by its trunk, yet with respect to the rest of its conformation, it is unwieldy and helpless. The neck is so short that it can scarcely turn the head, and must wheel round in order to discover an enemy from behind. The hunters that attack it upon that quarter generally thus escape the effects of its indignation; and find time to renew their assaults while the elephant is turning to face them. The legs are, indeed, not so inflexible as the neck, yet they are very stiff, and bend not without difficulty. Those before seem to be longer than the hinder; but upon being measured, are found to be something shorter. The joints, by which they bend, are nearly in the middle, like the knee of a man; and the great bulk which they are to support, makes their flexure ungainly. While the elephant is young, it bends the legs to lie down or to rise; but when it grows old, or sickly, this is not performed without human assistance, and it becomes, consequently, so inconvenient, that the animal chooses to sleep standing. The feet upon which these massy columns are supported, form a base scarcely broader than the legs they sustain. They are divided into five toes, which are covered beneath the skin, and none of which appear to the eye; a kind of protuberance like claws are only observed, which vary in number from three to five. The apparent claws vary; the internal toes are constantly the same. The sole of the foot is furnished with a skin as thick and hard as horn, and which completely covers the whole under-part of the foot.

To the rest of the elephant's encumbrances may be added its enormous tusks, which are unserviceable for chewing, and are only weapons of defence. These, as the animal grows old, become so heavy, that it is sometimes obliged to make holes in the walls of its stall to rest them in, and ease itself of the fatigue of their support. It is well-known to what an amazing size these tusks grow; they are two in number, proceeding

care with which the elephant endeavours to put his trunk out of danger, makes him extremely cautious of using it as a weapon. He rarely strikes with it; though he will frequently throw clods and stones with it at objects which he dislikes. Elephants often thus attack hogs, casting the missiles with tolerable force and precision.

from the upper jaw, and are sometimes found above six feet long. Some have supposed them to be rather the horns than the teeth of this animal ; but besides their greater similitude to bone than to horn, they have been indisputably found to grow from the upper jaw, and not from the frontal bones, as some have thought proper to assert.¹ Some also have asserted, that these tusks are shed in the same manner as the stag sheds its horns ; but it is very probable, from their solid consistence, and from their accidental defects, which often appears to be the effect of a slow decay, that they are as fixed as the teeth of other animals are generally found to be. Certain it is, that the elephant never sheds them in a domestic state, but keeps them till they become inconvenient and cumbersome to the last degree. An account of the uses to which these teeth are applied, and the manner of choosing the best ivory, belongs rather to a history of the arts than of nature.

This animal is equally singular in other parts of its conformation ; the lips and the tongue in other creatures serve to suck up and direct their drink or their food ; but in the elephant they are totally inconvenient for such purposes ; and it not only gathers its food with its trunk, but supplies itself with water by the same means. When it eats hay, as I have seen it frequently, it takes up a small wisp of it with the trunk, turns and shapes it with that instrument for some time, and then directs it into the mouth, where it is chewed by the great grinding teeth, that are large in proportion to the bulk of the animal. This packet, when chewed, is swallowed, and never ruminated again, as in cows or sheep, the stomach and intestines of this creature more rescubbling those of a horse. Its manner of drinking is equally extraordinary. For this purpose the elephant dips the end of its trunk into the water, and sucks up just as much as fills that great fleshy tube completely. It then lifts up its head with the trunk full, and turning the point into its mouth, as if it intended to swallow trunk and all, it drives the point below the opening of the windpipe. The trunk being in this position, and still full of water, the elephant then blows strongly into it at the other end, which forces the water it contains into the throat ; down which it is heard to pour with a loud gurgling noise, which continues till the whole is blown down. From this manner of

1 See Mr Daubenton's description of the skeleton of this animal.

drinking some have been led into an opinion that the young elephant sucks with its trunk, and not with its mouth ; this, however, is a fact which no traveller has hitherto had an opportunity of seeing, and it must be referred to some future accident to determine.¹

The hide of the elephant is as remarkable as any other part. It is not covered over with hair, as in the generality of quadrupeds, but is nearly bare. Here and there indeed a few bristles are seen growing in the scars and wrinkles of the body, but very thinly scattered over the rest of the skin ; but in general the head is dry, rough, and wrinkled, and resembling more the bark of an old tree than the skin of an animal. This grows thicker every year ; and by a constant addition of substance, it at length contracts that disorder well known by the name of elephantiasis, or Arabian leprosy ; a disease to which man, as well as the elephant, is often subject. In order to prevent this, the Indians rub the elephant with oil, and frequently bathe it, to preserve its pliancy. To the inconveniencies of this disorder is added another, arising from the great sensibility of those parts that are not callous. Upon these the flies settle in great abundance, and torment this animal unceasingly ; to remedy which, the elephant tries all its arts ; using not only its tail and trunk in the natural manner to keep them off, but even takes the branch of a tree, or a bundle of hay to strike them off with. When this fails, it often gathers up the dust with its trunk, and thus covers all the sensible places. In this manner it has been seen to dust itself several times a-day, and particularly upon leaving the bath. Water is as necessary to this animal as food itself. When in a state of nature, the elephant rarely quits the banks of the river, and often stands in water up to the belly. In a state of servitude, the Indians take equal care to provide a proper supply ; they wash it with great address ; they give it all the conveniencies for lending assistance to itself ; they smooth the skin with a pumice-stone, and then rub it over with oils, essences, and odours.

It is not to be wondered at, that an animal furnished with so

¹ The young elephant, it is now known, does not suck by the trunk, but by the mouth only as in all other quadrupeds ; during which the trunk of the young is thrown back over the head.

many various advantages, both of strength, sagacity, and obedience, should be taken into the service of man. We accordingly find that the elephant, from time immemorial, has been employed either for the purposes of labour, of war, or of ostentation; to increase the grandeur of eastern princes, or to extend their dominions. We have hitherto been describing this animal in its natural state; we now come to consider it in a different view, as taken from the forest, and reduced to human obedience. We are now to behold this brave harmless creature as learning a lesson from mankind, and instructed by him in all the arts of war, massacre, and devastation. We are now to behold this half-reasoning animal led into the field of battle, and wondering at those tumults and that madness which he is compelled to increase. The elephant is a native of Africa and Asia, being found neither in Europe nor America. In Africa he still retains his natural liberty. The savage inhabitants of that part of the world, instead of attempting to subdue this powerful creature to their necessities, are happy in being able to protect themselves from his fury. Formerly, indeed, during the splendour of the Carthaginian empire, elephants were used in their wars; but this was only a transitory gleam of human power in that part of the globe; the natives of Africa have long since degenerated, and the elephant is only known among them from his devastations. However, there are no elephants in the northern parts of Africa at present, there being none found on this side of Mount Atlas. It is beyond the river Senegal that they are to be met with in great numbers, and so down to the Cape of Good Hope, as well as in the heart of the country. In this extensive region they appear to be more numerous than in any other part of the world. They are there less fearful of man: less retired into the heart of the forests, they seem to be sensible of his impotence and ignorance; and often come down to ravage his little labours. They treat him with the same haughty disdain which they show to other animals, and consider him as a mischievous little being, that fears to oppose them openly.

But although these animals are most plentiful in Africa, it is only in Asia that the greatest elephants are found, and rendered subservient to human command. In Africa, the largest do not exceed ten feet high; in Asia, they are found from ten to fifteen. Their price increases in proportion to their size; and when

they exceed a certain bulk, like jewels, their value then rises as the fancy is pleased to estimate.

The largest are entirely kept for the service of princes ; and are maintained with the utmost magnificence, and at the greatest expense. The usual colour of the elephant, is a dusky black, but some are said to be white ; and the price of one of these is inestimable. Such a one is peculiarly appropriated for the monarch's own riding ; he is kept in a palace, attended by the nobles, and almost adored by the people.¹ Some have said that these white elephants are larger than the rest ;² others assert that they are less ; and still others entirely doubt their existence.

As the art of war is but very little improved in Asia, there are few princes of the East who do not procure and maintain as many elephants as they are able, and place great confidence on their assistance in an engagement. For this purpose they are obliged to take them wild in their native forests, and tame them , for the elephant never breeds in a state of servitude. It is one of the most striking peculiarities in this extraordinary creature, that his generative powers totally fail when he comes under the dominion of man ; as if he seemed unwilling to propagate a race of slaves to increase the pride of his conqueror. There is, perhaps, no other quadruped that will not breed in its own native climate, if indulged with a moderate share of freedom ; and we know that many of them will copulate in every climate. The elephant alone has never been seen to breed ; and though he has been reduced under the obedience of man for ages, the duration of pregnancy in the female³ still remains a secret. Aristotle, indeed, asserts, that she goes two years with young ; that she continues to suckle her young for three years, and that she brings forth but one at a time : but he does not inform us of the manner in which it was possible for him to have his information. From authorities equally doubtful, we learn, that the little one is about as large as a wild boar the instant it is brought forth ; that its tusks do not yet appear ; but that all the rest of its teeth are apparent ; that at the age of six months, it is as large as an

1 P. Vincent Marie.

2 P. Tachard.

3 Multis persuasum est elephantem non brutorum sed hominum more coire. Quod retro mingit non dubitatur. Sed ipse vidi marem hujusce speciei, in nostri regis stabulis, super fœmellam itidem inclusam quadrupedum more silientem, pene paululum incurvato sed sufficienter recto.

ox, and its tusks pretty well grown; and that it continues in this manner, for near thirty years, advancing to maturity. All this is doubtful; but it is certain that, in order to recruit the numbers which are consumed in war, the princes of the East are every year obliged to send into the forests, and to use various methods to procure a fresh supply. Of all these numerous bands, there is not one that has not been originally wild; nor one that has not been forced into a state of subjection. Men themselves are often content to propagate a race of slaves, that pass down in this wretched state through successive generations: but the elephant, under subjection, is unalterably barren; perhaps from some physical causes, which are as yet unknown.*

The Indian princes having vainly endeavoured to multiply the

* On this point Goldsmith was misinformed, for Ælian asserts, that elephants were bred at Rome; and Columella, a writer on rural affairs, distinctly says, "within our own walls (Rome) we have seen elephants born." In India it was thought unlucky to allow tame elephants to breed; but the Emperor Akber overcame that scruple. The custom, however, evidently went into disuse; for Tavernier, and other oriental travellers, were not only ignorant of the fact, but expressly asserted that the circumstance never took place. Upon this inaccurate information many writers on natural history founded a theory that the proud elephant refused to multiply slaves for the use of man. The experiments of Mr Corse have, however, completely set this question at rest; and though it is probable, as long as elephants are sufficiently numerous to be taken in herds, that the greater expense of breeding them will discourage any attempts to continue the species under the direction of man, there is no doubt, if it were desirable, that the elephant might be improved in size, strength, and activity, exactly in the same manner that the horse of England has been rendered so superior in power and swiftness to the horse in a state of nature, by a judicious intermixture of various races.

The ordinary period of gestation in the elephant is twenty months and eighteen days. This point has been established by the observations of Mr Corse. The young elephant at its birth is about thirty-five inches high. In the first year he grows about eleven inches; in the second eight; in the third six; in the fourth five; in the fifth five; in the sixth three and a half; and in the seventh two and a half. Mr Corse thinks that elephants attain their full size between eighteen and twenty-four years of age; though other writers, reasoning from the duration of life, believe that the animal continues to increase in size, when in a state of nature, for nearly double that period.

Mr Ranking, who was resident many years in Hindostan, "saw an elephant in Bengal when it was only eighteen hours old. It was about thirty-three inches high, weak and tottering, but very playful, twisting in its proboscis a few blades of large grass." That the young elephant sucks with its mouth is now distinctly ascertained. Mr Corse's account of the actual process is the most precise which we have met with. "The young

breed of elephants, like that of other animals, have been at last content to separate the males from the females, to prevent those accesses of desire, which debilitated without multiplying the species. In order to take them wild in the woods, a spot of

of the elephant, at least all those I have seen, begin to nibble and suck the breast soon after birth, pressing it with the trunk, which by natural instinct they know will make the milk flow more readily into the mouth, while sucking. Elephants never lie down to give their young ones suck; and it often happens, when the dam is tall, that she is obliged for some time to bend her body towards her young, to enable him to reach the nipple with his mouth: consequently, if ever the trunk was used to lay hold of the nipple it would be at this period, when he is making laborious efforts to reach it with his mouth, but which he could always easily do with his trunk, if it answered the purpose. In sucking, the young elephant always grasps the nipple, which projects horizontally from the breast, with the side of his mouth. I have very often observed this; and so sensible are the attendants of it, that with them it is a common practice to raise a small mound of earth, about six or eight inches high, for the young one to stand on, and thus save the mother the trouble of bending her body every time she gives suck, which she cannot readily do when tied to her picket." M. Foncher d'Obsonville, who had also observed the young elephant playing with the teat of the mother with his trunk, attributes the prevalent error to this circumstance. M. Williamson says, that the position of the two breasts of the female enables the young one (technically called a calf) to suck as it runs along by the side of the mother, or even under her belly.

The affection of the female elephant for her young has been denied by some writers. Mr Williamson, however, gives an anecdote which contradicts this opinion. He says, "a female elephant will trust her young with great confidence among the human species, but is very jealous of all brutes. If, however, they suspect any trick, or perceive any danger, they become ungovernable. I recollect being one of many who were seated at the top of a flight of stone steps at the entrance into the Great House at Secrole, and had enticed the calf of a very fine, good-tempered elephant feeding below to ascend towards us. When she had nearly got up the steps her foot slipped, and she was in danger of falling; which being perceived by the mother, she darted to save the rambler, sending forth a most terrific roar, and with such a significant eye as made us all tremble. She guided the descent of her little one with wonderful caution, none of us feeling the least disposition to offer any aid on the occasion." Captain Knox, who was detained for twenty years a captive in Ceylon, says, "As the Chingalays report, they bear the greatest love to their young of all irrational creatures; for the shes are alike tender of any one's young ones as of their own. Where there are many she-elephants together, the young ones go and suck of any, as well as of their mothers: and if a young one be in distress, and should cry out, they will all in general run to the help and aid thereof; and if they be going over a river, as here be some somewhat broad, and the streams run very swift, they will all with their trunks assist and help to convey the young ones over."

During rutting time, which occurs in the spring, the elephants often become extremely violent; and it is believed, that at that period the larger

ground is fixed upon, which is surrounded with a strong pallisade. This is made of the thickest and the strongest trees; and strengthened by cross bars, which give firmness to the whole. The posts are fixed at such distances from each other that a man can easily pass between them; there being only one great passage left open, through which an elephant can easily come; and which is so contrived as to shut behind, as soon as the beast is entered. To draw him into this inclosure, it is necessary first to find him out in the woods; and a female elephant is conducted alone into the heart of the forest, where it is obliged by its keeper to

males or *Goordahs* are driven from the herd. It is necessary that those which are domesticated should be kept low at that season; but this does not always prove efficacious, and the animal is either turned out into the woods or destroyed, to prevent mischief. Three examples of this kind have occurred within a few years, in Europe. The first of them was in an elephant belonging to M. Garnier, which broke loose at Venice, and, after having done much mischief, was destroyed by a cannon ball. Another elephant belonging to the same person was remarkable for its docility, and in its journeys from town to town was conducted on foot by night, instead of being conveyed in a moveable den. Sufficient time having elapsed during his stay at Geneva to suit his owner's convenience, he was to have been removed elsewhere; but shortly previous to his departure he became irritable, although not refractory, and the journey was commenced. He had not, however, gone far from the city before he became ill-tempered to his keeper; and the man, being fearful, ran away, pursued by the angry beast into Geneva, where he was at last enticed into an inclosure. Three ounces of Prussic acid in brandy were given to him, but no effect was produced, and three ounces of arsenic mixed with honey and sugar were next taken, but with as little result; a second dose of the arsenic was offered; but he refused it, and it was then determined to destroy him by shooting him with a cannon ball, which entered near the ear, and the animal, after tottering for a few minutes, fell down and died. The third instance occurred in London, in 1826, at Exeter Change. About six years before, the elephant first exhibited symptoms of that natural excitement which occurs for a short time annually amongst these animals. From year to year this increased, but never was of sufficient importance to give cause for fear till last February, when he became excessively violent: medicines were administered, for the purpose of removing this excitement, but without effect: he became very unmanageable, and, driving with his head against the strong posts forming the front of his den, broke them in such manner as to render his confinement very uncertain, and to induce Mr Cross, his owner, to attempt his destruction. For this purpose arsenic was given in his oats, which he refused; and every subsequent endeavour to entice him to take food was futile, as he seemed to have some idea of the intended mischief, and throwing down whatever was offered to him, crushed it with his foot. At last it became necessary to shoot him, as all other attempts at his destruction entirely failed; but he was not destroyed till he had received 120 musket balls, and above an hour had been spent in the attack upon him.

cry out for the male. The male very readily answers the cry, and hastens to join her ; which the keeper perceiving, obliges her to retreat, still repeating the same cry, until she leads the animal into the enclosure already described, which shuts the moment he is entered. Still, however, the female proceeds calling and inviting, while the male proceeds forward in the enclosure, which grows narrower all the way, and until the poor animal finds himself completely shut up, without the power of either advancing or retreating ; the female in the meantime being let out by a private way, which she has been previously accustomed to. The wild elephant, upon seeing himself entrapped in this manner, instantly attempts to use violence ; and, upon seeing the hunters, all his former desires only turn to fury. In the meantime, the hunters, having fixed him with cords, attempt to soften his indignation, by throwing buckets of water upon him in great quantities, rubbing the body with leaves, and pouring oil down his ears. Soon after, two tame elephants are brought, a male and a female, that caress the indignant animal with their trunks ; while they still continue pouring water to refresh it. At last a tame elephant is brought forward, of that number which is employed in instructing the new-comers, and an officer riding upon it, in order to show the late captive that it has nothing to fear. The hunters then open the enclosure ; and while this creature leads the captive along, two more are joined on either side of it, and these compel it to submit. It is then tied by cords to a massy pillar, provided for that purpose, and suffered to remain in that position for about a day and a night, until its indignation be wholly subsided. The next day it begins to be somewhat submissive ; and in a fortnight is completely tamed like the rest. The females are taken when accompanying the males ; they often come into these enclosures, and they shortly after serve as decoys to the rest. But the method of taking the elephant differs, according to the abilities of the hunter : the negroes of Africa, who hunt this animal merely for its flesh, are content to take it in pit-falls ; and often to pursue it in the defiles of a mountain, where it cannot easily turn, and so wound it from behind till it falls.*

* Elephant hunts are carried on in different modes in different parts of India, and according as it is intended to secure a single animal or the whole herd.

The elephant, when once tamed, becomes the most gentle and obedient of all animals. It soon conceives an attachment for the person that attends it, caresses him, obeys him, and seems to anticipate his desires. In a short time it begins to compre-

The *Goonlah*, or large male, is taken by means of four *Koomkees*, or female elephants, trained for the purpose, which are brought near to the spot where he is observed to come out of the jungle to feed. If there be more than one of these males, the hunter decides which he will secure, and advances towards him, silently and cautiously, with three *Koomkees*, which feed as they go along, to induce the male to suppose they are wild. If he be amorously inclined, as is generally the case, he will allow their approach; and two of them pass one on each side of him, with their tails towards his head, whilst a third goes behind and places herself across his tail. During the time he is engaged in toying with them, a fourth female comes up with the assistants and ropes. The hunters then creep under the bellies of the tame elephants, and fasten the hind legs of the wild animal together with ropes, twisting them like a figure of eight bandage. A strong cable, about sixty feet in length, is next passed around each hind leg, and another figure of eight bandage wound round above them. Having proceeded thus far, the female elephants are withdrawn, and in his endeavour to follow, the male soon finds out the fettered state in which he is, and attempts to make his escape. The hunters follow, holding the cables till they meet with a strong tree, around the trunk of which they turn the cable a few times, and thus prevent his further retreat. This of course enrages him very much, and in his attempts to get away he exhausts himself, and then the females resuming their former station about him, the cables are shortened, and being passed round his hind legs and the trunk of the tree, his escape is completely prevented, and his fore legs are tied in the same manner. After being kept a little while in this situation, and having taken some food, preparations are made for his safe removal: in order to effect this, a strong cable is passed round his body, and tied behind the shoulder, and the remainder of it, being continued back, is passed round his loins and fastened: with the latter a kind of kicking strap or rope is connected, and another, answering to a crupper, is continued under his tail and along the belly till it reaches the cable behind the shoulder to which it is fastened: another rope is next passed round his buttocks to prevent him from taking a full step, and lastly, two cables with nooses are passed round his neck, and fastened to the shoulder rope; the ends of the latter are then attached to girths round the bodies of two females, and, his trappings being thus completed, he is removed as soon as the ground is cleared over which he has to pass. In performing this service, the *Muhouts* sit as usual upon the necks of the females, but are covered with a dark cloth, that they may escape the notice of the animal which they wish to capture. Sometimes in the midst of their operations the male observes them, and becoming enraged, they get off the ground by running up a rope attached around the *Koomkee's* neck, and then make their way off as speedily as possible.

When a whole herd is to be taken, the mode employed is very different. A number of persons, to the amount of 500, divide into small parties, forming a large circle round the herd: each party lights a fire, and clears a road

herd several of the signs made to it, and even the different sounds of the voice ; it perfectly distinguishes the tone of command from that of anger or approbation, and acts accordingly. It is seldom deceived in its master's voice ; it receives his orders,

to the next station, which concludes the first day's work. On the following morning a new, but more circumscribed, circle is formed, except towards that point to which they wish the elephants to move, to either side of which those parties advance which were most in the rear. A great noise is then made, and the elephants, being alarmed, proceed forwards, and a new circle is formed, which from day to day is lessened, till they arrive at the *Keddah*, or place in which they are to be secured, and which consists of three inclosures, of which the first is the largest, and the last the smallest. The inclosures are constructed of strong palisades, fastened on the outer side by buttresses, and each surrounded by a deep ditch : the entrances to them are narrow and dressed with trees and bamboos, to imitate a jungle. To the first inclosure, or *Baigcote*, are two entrances, and the great difficulty is to induce the elephants to enter it, as the leader appears to suspect a snare, but after one has passed the whole herd follow. The gates are then barricaded, fires raised around the inclosure, and a great noise set up to drive the animals into the second, or *Doobrazeecote*, and afterwards into the third, or *Rajecote*. During the time that the herd is confined in the inclosures, they make frequent attempts to escape, but at whatever quarter they endeavour so to do, the hunters thrust in burning grass through the palisades, and make a great noise to frighten them off. Having been driven into the last inclosure, they are kept there for some days, and fed sparingly, near the *Roomee* ; but care is taken that there be a pool of water within the inclosure for the herd to refresh themselves. In order to secure them, the gates leading to the *Roomee* (which is a narrow passage sufficient to allow an elephant to pass into, but not turn round in it) are opened, and one of the animals is enticed into it ; the gates are then shut, and after he has fatigued himself, in his exertions to escape, ropes with nooses are thrown down, and as soon as he treads in one it is drawn tight, and his leg secured to the palisade, and so on till all four are tied : after which, men enter and secure him with ropes, as has been before described, when he is brought to the end of the *Roomee*, and fastened to two female elephants, in readiness for that purpose, which conduct him to a tree to which he is bound. Sometimes, instead of driving the herd into different inclosures, and into the *Roomee* to be bound, there is but one large inclosure, and into this the *Koomkees* are sent, and the elephants are tied in the same mode employed for securing the *Goondahs*.

Such is the mode of elephant hunting in India, but in Ceylon there is some difference. A large inclosure is made with cocoa wood around a pool of water, into which are several long and tortuous passages for the elephants, and some smaller wickets for the hunters. The ponds having been guarded for some days, to prevent the animals getting access to them, they are beset in the woods by the natives, who drive them out ; when, finding themselves surrounded on every side except on that of the inclosed passages, they are compelled by thirst and the surrounding noise, which is continually kept up, to pass through these into the inclosure. Here they are

with attention, and executes them with prudence, eagerly, yet without precipitation. All its motions are regulated, and its actions seem to partake of its magnitude; being grave, majestic, and secure. It is quickly taught to kneel down, to receive its rider; it caresses those it knows with its trunk; with this salutes such as it is ordered to distinguish, and with this, as with a hand, helps to take up a part of its load. It suffers itself to be arrayed in harness, and seems to take a pleasure in the finery of its trappings. It draws either chariots, cannon, or shipping, with surprising strength and perseverance; and this with a seeming satisfaction, provided that it be not beaten without a cause, and that its master appears pleased with its exertions.*

separated by the hunters, and driven into smaller inclosures, where they are fettered with ropes.

When the elephant has been secured to a tree, he is tended by a *mahout*, and three or four *coolies*, who supply him with food and water, and endeavour to attach him by kind treatment, driving away the flies, and scratching his head and trunk with a coarse kind of broom, made by splitting one end of a long bamboo into many pieces; frequently also squirting water over him, to refresh him. By degrees he allows his keeper to approach and pat him gently, at which time he is talked to in a soothing tone: in a short time an acquaintance is formed between them, and the *mahout* gets on his back from a tame elephant, and, as the animal becomes more submissive, gradually comes forward to his neck, which is the driver's usual seat. During this period he is occasionally led out for exercise by the tame elephants, and in five or six weeks obeys the orders of his keeper, after which the cords are gradually removed, and in the course of six or seven months he is sufficiently subdued to be led about from place to place by his *mahout*; care however, being taken that he is not brought to his old haunts, lest he might endeavour to escape.

* The Duke of Devonshire, having been asked by a lady of rank what she should send him from India, and having laughingly answered, "Oh, nothing smaller than an elephant," was surprised to find, at the expiration of some months, a very handsome female of the species consigned to his care.

The Duke of Devonshire's elephant was kept at his grace's villa at Chiswick, under circumstances peculiarly favourable to its health and docility. The house in which she was shut up was of large dimensions, well ventilated, and arranged in every particular with a proper regard to the comfort of the animal. But she often had the range of a spacious paddock; and the exhibition of her sagacity was therefore doubly pleasing, for it was evidently not effected by rigid confinement. At the voice of her keeper she came out of her house, and immediately took up a broom, ready to perform his bidding in sweeping the paths or the grass. She would follow him round the inclosure with a pail or a watering-pot, showing her readiness to take that share of labour which the elephants of the East are so willing to perform. Her reward was a carrot and some water; but previously to satisfying her

The elephant's conductor is usually mounted upon its neck, and makes use of a rod of iron to guide it, which is sometimes pointed, and at others bent into a hook. With this the animal is spurred forward when dull or disobedient; but, in general, a

thirst by an ample draught, she would exhibit her ingenuity in emptying the contents of a soda-water bottle, which was tightly corked. This she effected in a singularly adroit manner. Pressing the small bottle against the ground with her enormous foot, so as to hold it securely at an angle of about forty-five degrees, she gradually twisted out the cork with her trunk, although it was very little above the edge of the neck; then without altering the position, she turned her trunk round the bottle, so that she might reverse it, and thus empty the water into the extremity of the proboscis. This she accomplished without spilling a drop; and she delivered the empty bottle to her keeper before she attempted to discharge the contents of the trunk into the mouth. She performed another trick which required equal nicety and patience. The keeper, who was accustomed to ride on her neck like the *mahouts*, or elephant-drivers of India, had a large cloth or housing which he spread over her, when he thus bestrode her in somewhat of oriental state. Upon alighting, which she allowed him to do by kneeling, he desired her to take off the cloth. This she effected by putting the muscles of her loins in action, so that the shrinking of her loose skin gave motion to the cloth, and it gradually wriggled on one side, till it fell by its own weight. The cloth was then, of course, in a heap; but the elephant, spreading it carefully upon the grass with her trunk, folded it up, as a napkin is folded, till it was sufficiently compact for her purpose. She then poised it with her trunk for a few seconds, and by one jerk threw it over her head to the centre of her back, where it remained as steady as if the burden had been adjusted by human hands. The affection of this poor animal for her keeper was very great. The man who had the charge of her in 1828, had attended her for five years, having succeeded another who had been with her eight or ten years. When first placed under his charge, she was intractable for some time, evidently resenting the loss of her former friend; but she gradually became obedient and attached, and would cry after him whenever he was absent for more than a few hours. The elephants of India, in the same way, cannot easily be brought to obey a stranger, and manifest a remarkable knowledge of their old *mahouts* if they should meet after a long separation. The elephant of the Duke of Devonshire was about twenty-one years old when she died, early in 1829. We have understood that the disease which carried her off was pulmonary consumption.

The inhabitants of this country recently witnessed the dramatic exhibition of an elephant, which afforded them a more remarkable example of the sagacity of this quadruped than the ordinary docility which it manifests at the command of the showman. This elephant was a large female from Siam, named Mademoiselle D'Jeck, and was exhibited in the Adelphi Theatre, London, and various provincial theatres. Last year (1830) she was taken to America. She was well disciplined, and exhibited her feats with considerable effect, by their adaptation to scenic display. To march in a procession, to kneel down without any more perceptible bidding than the waving of a hand, to salute a particular individual, to place a crown upon the head of "the true

word is sufficient to put the gentle creature into motion, especially when it is acquainted with its conductor. This acquaintance is often perfectly necessary; for the elephant frequently takes such an affection to its keeper, that it will obey no other;

prince," to eat and drink with great gravity and propriety of demeanour, and to make her reverence to an audience without any apparent signal, are very striking evidences of the tractability of the creature: but they are by no means of the class of novel exhibitions, and they have been excelled by other performances, of which we have a distinct record. One of the most remarkable narratives of the ancient display of elephants in a theatre, is that of Ælian, who has described, in a very lively manner, the extreme docility of the elephants of Germanicus. At that period elephants were *bred* at Rome—a fact which has been most unaccountably overlooked in the descriptions of modern naturalists, but the practicability of which has received abundant confirmation from recent experience. Great care, according to Ælian, was paid to their health; and the nicest discipline was used to extinguish whatever was ferocious in their nature, and to call forth their sagacity by undeviating kindness. Particular attention was directed to the effect of music upon them; and they were so accustomed to musical instruments, that they not only lost all dread of the clashing of cymbals, but learnt to feel delight at the gentle notes of flutes, and would beat time with their feet when their ears were gratified with the agreeable sounds to which they were habituated. Their keeper accustomed them also to the sight of great multitudes of people. Upon an occasion when a particular exhibition of the docility of the elephants was required, twelve of the most sagacious and well-trained were selected, who, marching into the theatre with a regular step, at the voice of their keeper moved in harmonious measure, sometimes in a circle, and sometimes divided into parties, scattering flowers over the pavement. In the intervals of the dance, they would beat time to the music, still preserving their proper order. The Romans, with their accustomed luxury, feasted the elephants, after this display, with prodigal magnificence. Splendid couches were placed in the arena, ornamented with paintings, and covered with tapestry. Before the couches, upon tables of ivory and cedar, was spread the banquet of the elephants, in vessels of gold and silver. The preparations being completed, the twelve elephants marched in, six males clad in the robes of men, and six females attired as women. They lay down in order upon their couches, or "*Tricliniums* of festival recumbency,"* and, at a signal, extended their trunks and ate with most praiseworthy moderation. Not one of them, says Ælian, appeared the least voracious, or manifested any disposition for an unequal share of the food, or an undue proportion of the delicacies. They were as moderate, also, in their drink, and received the cups which were presented to them with the greatest decorum. According to Pliny, at the spectacles given by Germanicus, it was not an uncommon thing to see elephants hurl javelins in the air, and catch them in their trunks, fight with each other as gladiators, and then execute a Pyrrhic dance. Lastly, they danced upon a rope, and their steps were so practised and certain, that four of them traversed the rope, bearing a litter

* Sir T. Brown.

and it has been known to die for grief, when, in some sudden fit of madness, it has killed its conductor. We are told, that one of these, that was used by the French forces in India for the drawing their cannon, was promised, by the conductor, a reward,

which contained one of their companions who feigned to be sick.† This feat of dancing or walking upon a rope, might, perhaps, be doubted, if it rested merely upon the testimony of a single author; but the practice is confirmed by many ancient writers of authority, who agree with Pliny, that the elephants trained at Rome would not only walk along a rope forward, but retire backward with equal precision. Seneca describes an elephant who, at the command of his African keeper, would kneel down, and walk upon a rope. Suetonius also mentions, that an elephant in the presence of the Emperor Galba, climbed up an inclined rope to the roof of the theatre, and descend in the same way, bearing a sitter. Dion gives a similar testimony to the extraordinary power of so heavy an animal to walk along a rope without any balance—a docility which is the more wonderful, when we bear in mind that one of the strongest instincts which the elephant possesses, is that which impels him to experiment upon the stability of every surface which he is required to cross, before he will trust his body to the chance of breaking down the support which is prepared for him. The yielding rope must have called this instinct into action; although it should be observed, that the elephant will pass a bridge which vibrates, when nothing will induce him to set foot upon one whose tottering condition manifests its insecurity. It may a little abate our surprise at the rope-dancing faculty of the elephant, when we learn that a horse has exhibited the same performance. At the solemnities which attend the wedding of Robert, brother to the King of France, in 1237, a horse was ridden along a rope.

Amongst the curious feats of elephants, though less remarkable than those we have described, Arrian mentions, that he saw an elephant who, having a cymbal attached to each knee, and holding a third by his proboscis, beat a measure with astonishing exactness; and that other elephants danced in a circle round him, without deviating in the least from the time which their companion indicated. Busbequius (or Busbee), who was ambassador from the Emperor of Germany, to Constantinople, in 1555, saw an elephant there not only dance with elegance and accuracy, but play with a ball with great skill, throwing it with his trunk, and catching it again, as easily as a man could with his hands. Of the reverence which elephants may be taught to pay to human beings, we have several remarkable instances. An elephant is recorded to have saluted Domitian; and Martial has alluded to the circumstance in a nauseously flattering epigram, which intimates that the creature paid this homage without any command; and that he instinctively felt the divinity, as the poet calls it, of this pampered tyrant. The elephant which Emanuel of Portugal presented to Leo X. went upon his knees, with a profound inclination of his head, when he first saw the Pope. The veneration of the elephant for persons in authority has descended to those of secondary

* *Plinii Nat. Hist. lib. viii. c. 2.* It is difficult to understand how the elephants could carry a litter, without walking along two parallel ropes. The text of Pliny gives no elucidation of this point.

for having performed some painful service ; but being disappointed of its expectations, it slew him in a fury. The conductor's wife, who was a spectator of this shocking scene, could not restrain her madness and despair ; but running with her two chil-

dignity ; for Cardan saw the one belonging to the Queen of Bohemia, which was also very sagacious in other respects, welcome an archbishop of Milan, upon his bended knees. Such homage as this, however agreeable it may be to human pride, is as worthless as that which Augustus received upon his triumphal entry into Rome, after the battle of Actium, when the parrots from the windows cried out "Honour and victory to Cæsar." The conqueror gave enormous prices for these sagacious birds ; but one bird, unluckily forgetting his last lesson, repeated that which he had been taught when the success of Augustus over his great rival was not so sure—"Honour and victory to Antony the Emperor"—and then Augustus grew tired of his winged flatterers, as he called them,—perhaps without making the discovery that all flatterers are equally contemptible.

The exhibition of M'selle D'Jeck, however it may have been exceeded by the feats of the elephants of antiquity, was exceedingly curious and instructive. The animal took part in the scene with almost undeviating precision ; displayed no want of confidence or self-possession in the midst of lights, and music, and the shouts of the people ; and made her parting salute with as much grace as if she had Emperors and Popes only to bow to. One of the most curious scenes in which she took a prominent part, was that in which she assisted the e-cape of the Princee and his adherents from prison, by kneeling upon her hind legs, and thus forming an inclined plane, upon which her friends might safely reach the ground.

When first brought out upon the stage M'selle D'Jeck would not be led to any particular point, till she had carefully tried the strength of the boards upon which she trod, thrusting her trunk upon every suspicious spot, and slowly and hesitatingly placing her feet in advance, before she moved her body forward. A remarkable example of this instinct is mentioned by Johnson in his *Indian Field Sports* :—"An elephant belonging to Mr Boddam, of the Bengal civil service at Gyah, used every day to pass over a small bridge, leading from his master's house into the town of Gyah. He one day refused to go over it, and it was with great difficulty, by goading him most cruelly with the *hawkuss* (an iron instrument,) that the *mohout* (driver) could get him to venture on the bridge, the strength of which he first tried with his trunk, showing clearly that he suspected that it was not sufficiently strong. At last he went on, and before he could get over, the bridge gave way, and they were precipitated into the ditch, which killed the driver, and considerably injured the elephant."

This instinct which the elephant possesses of trying the strength of any construction, whether natural or artificial, which it is necessary for him to cross, is particularly worthy of observation. When the enormous weight of a full-grown elephant is considered, it must be obvious, that if the creature were rashly to place his body upon any frail support his danger would be extreme. His caution, therefore, in avoiding such an evil is constantly exercised ; and the powerful as well as delicate instrument of touch which he possesses enables him always to be convinced of his security, without incurring any risk under ordinary circumstances. The elephant at the Adphi

dren in her arms, threw them at the elephant's feet, crying out, that since it had killed her husband it might kill her and her children also. The elephant, seeing the children at its feet, instantly stopped, and moderating its fury, took up the eldest with its trunk, and placing him upon its neck, adopted him for its conductor, and obeyed him ever after with great punctuality.

But it is not for drawing burdens alone, that the elephants are serviceable in war; they are often brought into the ranks, and compelled to fight in the most dangerous parts of the field of battle. There was a time, indeed, in India when they were much more used in war than at present. A century or two ago, a great part of the dependence of the general was upon the number and the expertness of his elephants; but of late, since war has been contented to adopt fatal instead of formidable arts, the elephant is little used, except for drawing cannon, or transporting provisions. The princes of the country are pleased to keep a few for ornament, or for the purposes of removing their seraglios; but they are seldom led into a field of battle, where they are unable to withstand the discharge of fire-arms, and have often been found to turn upon their employers. Still, however, they are used in war, in the more remote parts of the East; in Siam, in Cochin-China, in Tonquin, and Pegu. In all these places they not only serve to swell the pomp of state, being adorned with all the barbarian splendour that those countries can bestow, but they are actually led into the field of battle, armed before with coats of mail, and loaded on the back each with a square tower, containing from five combatants to seven. Upon its neck sits the conductor, who goads the animal into the thickest ranks, and encourages it to increase the devastation: wherever it goes, nothing can withstand its fury; it levels the

retained this instinct in full force, however she might have been led away from her natural habits by the artificial restraints of her discipline;—and we, therefore, give full belief to the assertion. We are not quite so prepared to believe what we have also heard stated with regard to this animal, that, upon being satisfied of the strength of the stage, and finding herself in a theatre, she immediately, without any direction from her keeper, began to rehearse the scenes which she had previously performed at Paris. Pliny, however, tells us, that an elephant, having been punished for his inaptitude in executing some feat which he was required to learn, was observed at night endeavouring to practise what he had vainly attempted in the day;—and Plutarch confirms this, by mentioning an elephant who practised his theatrical attitudes, alone, by moonlight.

ranks with its immense bulk, flings such as oppose it into the air, or crushes them to death under its feet. In the meantime those who are placed upon its back, combat as from an eminence, and fling down their weapons with double force, their weight being added to their velocity. Nothing, therefore, can be more dreadful, or more irresistible, than such a moving machine, to men unacquainted with the modern arts of war; the elephant thus armed and conducted, raging in the midst of the field of battle, inspires more terror than even those machines that destroy at a distance, and are often most fatal when most unseen. But this method of combating is rather formidable than effectual: polished nations have ever been victorious over those semi-barbarous troops that have called in the elephant to their assistance or attempted to gain a victory by merely astonishing their opposers. The Romans quickly learned the art of opening their ranks to admit the elephant, and thus separating it from assistance, quickly compelled its conductors to calm the animal's fury, and to submit. It sometimes also happened that the elephant became impatient of control; and, instead of obeying its conductor, turned upon those forces it was employed to assist. In either case, there was a great deal of preparation to very little effect, for a single elephant is known to consume as much as forty men in a day.

At present, therefore, they are chiefly employed in carrying, or drawing burdens, throughout the whole Peninsula of India; and no animal can be more fitted by nature for this employment. The strength of an elephant is equal to its bulk, for it can, with great ease, draw a load that six horses could not move; it can readily carry upon its back three or four thousand weight; upon its tusks alone it can support near a thousand: its force may also be estimated from the velocity of its motion, compared to the mass of its body. It can go, in its ordinary pace, as fast as a horse at an easy trot; and, when pushed, it can move as swiftly as a horse at full gallop. It can travel with ease fifty or sixty miles a-day; and, when hard pressed, almost double that distance. It may be heard trotting on at a great distance; it is easy also to follow it by the track, which is deeply impressed on the ground, and from fifteen to eighteen inches in diameter.

In India they are also put to other very disagreeable offices;*

* The elephant, although the mildest and most inoffensive of quadrupeds,
11. 2 S

for in some courts of the more barbarous princes they are used as executioners : and this horrid task they perform with great dexterity : with their trunks they are seen to break every limb of the criminal at the word of command ; they sometimes trample him to death, and sometimes impale him on their enormous tusks, as directed. In this the elephant is rather the servant of a cruel master than a voluntary tyrant, since no other animal of the forest is so naturally benevolent and gentle ; equally mindful of benefits as sensible of neglect, he contracts a friendship for his keeper, and obeys him even beyond his capacity.

In India, where they were at one time employed in launching ships, a particular elephant was directed to force a very large vessel into the water : the work proved superior to its strength, but not to its endeavours ; which, however, the keeper affected to despise. " Take away," says he, " that lazy beast, and bring another better fitted for service." The poor animal instantly upon this redoubled its efforts, fractured its skull, and died upon the spot.

In Delhi, an elephant passing along the streets put his trunk into a tailor's shop, where several people were at work. One of the persons of the shop, desirous of some amusement, pricked the animal's trunk with his needle, and seemed highly delighted

is often made a sufferer from the propensity of man to cruel sports. In India, elephants are to this day baited ; and the native chiefs and nobles attach great importance to these displays. When Bishop Heber was at the court of Baroda, " The Raja," he says, " was anxious to know whether I had observed his rhinoceros and his hunting tigers, and offered to show me a day's sport with the last, or to bait an elephant for me ; a cruel amusement which is here not uncommon.—I do not think he understood my motive for declining to be present. A Mussulman, however, who sat near him, seemed pleased by my refusal, said it was ' very good,' and asked me if any of the English clergy attended such sports. I said it was a maxim with most of us to do no harm to any creature needlessly : which was, he said, the doctrine of their learned men also." At the palace of Jyepoor, says the same humane person, " we were shown five or six elephants in training for a fight. Each was separately kept in a small paved court, with a little litter but very dirty. They were all what is called ' must,' that is, fed on stimulating substances to make them furious ; and all showed in their eyes, their gaping mouths, and the constant motion of their trunks, signs of fever and restlessness. Their mohouts seemed to approach them with great caution ; and on hearing a step they turned round as far as their chains would allow, and lashed fiercely with their trunks. I was moved and disgusted at the sight of so noble creatures, thus maddened and diseased by the absurd cruelty of man, in order that they might for his diversion inflict fresh pain and injuries on each other."

with this slight punishment. The elephant, however, passed on without any immediate signs of resentment; but coming to a puddle filled with dirty water, he filled his trunk, returned to the shop, and spurted the contents over all the finery upon which the tailors were then employed.

An elephant in Adsmeer, which often passed through the bazar or market, as he went by a certain herb-woman, always received from her a mouthful of greens. Being one day seized with a periodical fit of madness he broke his fetters, and running through the market, put the crowd to flight, and among others, this woman, who, in her haste forgot a little child at her stall. The elephant recollecting the spot where its benefactress was accustomed to sit, took up the infant gently in its trunk, and conveyed it to a place of safety.

At the Cape of Good Hope it is customary to hunt those animals for the sake of their teeth.* Three horsemen, well

* Before the settlements of the Portuguese on the coasts of Africa, in the latter part of the fifteenth century, the elephant ranged without much interruption, on the banks of the great rivers, whose courses, even at our own days, have not been completely traced. In the plains of the kingdom of Congo, where the herbage attains a wild luxuriance amidst innumerable lakes, and on the borders of the Senegal, whose waters run through extensive forests, herds of elephants had wandered for ages in security. The poor African, indeed, occasionally destroyed a few stragglers, to obtain a rare and luxurious feast of the more delicate parts of their flesh; and the desire for ornament, which prevails even in the rudest forms of savage life, rendered the chiefs of the native hordes anxious to possess the tusk of the elephant, to convert it into amulets and other fanciful embellishments of their persons. Superstition, too, occasionally prompted the destruction of this powerful animal; for the tail of the elephant had become an object of reverence, and therefore of distinction to its possessor: and the huntsman, accordingly, devoted himself to steal upon the unsuspecting elephant in his pasture, and to cut off his tail with a single stroke of his rugged hatchet. But these were irregular and partial incentives to the destruction of the most mighty, and, at the same time, the most peaceful inhabitant of the woods. The steady and inexorable demands of commerce had not yet come to the shores of Africa, to raise up enemies to him in all the tribes amongst whom he had so long lived in a state of comparative security. The trade in ivory had been suspended for more than a thousand years. There were periods, indeed, in the history of the refined nations of antiquity, when this destruction of the elephant was as great as in modern times:—when Africa yielded her tributes of elephants' teeth to the kings of Persia; when the people of Judea built "ivory palaces;" when the galleys of Tyre had "benches of ivory;" when, contributing to the barbarous luxury of the early Grecian princes,

"The spoils of elephants the roofs inlay;"

mounted, and armed with lances, attack the elephant alternately, each relieving the other, as they see their companion pressed, till the beast is subdued. Three Dutchmen, brothers, who had made large fortunes by this business, determined to retire to

when the Etruscan attributes of royalty were sceptres and thrones of ivory; when the ancient kings and magistrates of Rome sat in ivory seats, when colossal ivory statues of their gods, far exceeding, in their vast proportions and their splendid ornaments, all the magnificence of the moderns, were raised by the Greeks of the age of Pericles; and when immense stores of ivory, to be employed with similar prodigality, were collected in the temples. In the time of Pliny, the vast consumption of ivory for articles of luxury had compelled the Romans to seek for it in another hemisphere; Africa had ceased to furnish elephants' tusks, except of the smallest kind. A century or two earlier, according to Polybius, ivory was so plentiful in Africa, that the tribes on the confines of Ethiopia employed elephants' tusks as door-posts, and for the palisades that inclosed their fields. When the Roman power fell into decay, and the commerce of Europe with Africa was nearly suspended for centuries, the elephant was again unmolested in those regions. He was no longer slaughtered to administer to the pomp of temples, or to provide ornaments for palaces. The ivory tablets of the citizens of ancient Rome (*libri elephantini*) had fallen into disuse; and the toys of modern France were constructed of less splendid materials. At Angola, elephants' teeth had become so plentiful, because so useless as an article of trade, that in the beginning of the seventeenth century, according to Andrew Battell, an Englishman, who served in the Portuguese armies, the natives "had their idols of wood in the midst of their towns, fashioned like a negro, and at the foot thereof was a great heap of elephants' teeth, containing three or four tons of them: these were piled in the earth, and upon them were set the skulls of dead men, which they had slain in the wars, in monument of their victory." The people of Angola and Congo, when the Portuguese first established themselves there, were found to have preserved an immense number of elephants' teeth, for centuries, and had applied them to such superstitious uses. As long as any part of the stock remained, the vessels of Portugal carried large quantities to Europe: and this traffic formed one of the most profitable branches of the early trade with Africa. About the middle of the seventeenth century the store was exhausted. But the demand for ivory which had been thus renewed in Europe, after the lapse of so many centuries, offered too great a temptation to the poor African to be allowed by him to remain without a supply. The destruction of elephants for their teeth was again unremittingly pursued throughout those extensive forests; and that havoc has gone on with little, if any, diminution, to our own day.

It would be difficult to estimate with any pretension to accuracy the present consumption of ivory in Europe. Its use must have been considerably diminished, on the one hand, by the changes of taste, which have dispensed with the ivory beds, and ivory chairs, that adorned the palaces of princes in the age of Leo X.; and have displaced the inlaid tables and cabinets of a century later, by articles of furniture distinguished rather for the excellence of their workmanship than for the cost of their material. But, on the other

Europe, and enjoy the fruits of their labours; but they resolved, one day before they went, to have a last chase, by way of amusement: they met with their game, and began their attack in the usual manner: but, unfortunately, one of their horses falling, happened to fling his rider; the enraged elephant instantly seized

hand, the increase of comforts and luxuries amongst the middle classes of society, and the love of tasteful ornament which has descended from the palace to the cottage (one satisfactory symptom of intellectual advancement) has probably increased the consumption of ivory in smaller articles. We understand that at Dieppe there are at present eleven flourishing manufactories of articles in ivory, from which various specimens of art, from the commonest piece of turnery to the most elaborate carving, are dispersed throughout the continent. Much is employed for crucifixes, and other appendages of Roman Catholic worship. In our own country the demand for elephants' teeth, to be employed in the manufacture of musical instruments, plates for miniatures, boxes, chess-men, billiard-balls, mathematical rules, and small pieces of carving, is much more considerable than might occur to a superficial observation. In 1827, the Customs upon elephants' teeth, the duty being 20s per cwt., amounted to £3,257, exhibiting an importation of 364,784 lbs. In eleven years, from 1788 to 1798, 18,914 cwt. of ivory was imported, which shows an average annual importation of 192,579 lbs. The consumption, therefore, is either increased in Great Britain, or, from our possession of the colony of the Cape of Good Hope, we are enabled to supply the demands of foreign nations.

The average weight of an elephant's tusk is about 60 lbs. To have produced, therefore, 364,784 lbs. of ivory, the import of 1827, 6080 tusks must have been procured. This fact assumes the annual slaughter of at least 3040 elephants. But the real havoc is much greater. Mr Burchell, in his travels in Africa, met with some elephant hunters, who had shot twelve elephants, which, however, produced no more than two hundred pounds weight of ivory, as all the animals, excepting one, happened to be females. If any thing like the same ill-luck, or want of skill, attended all the African elephant hunters, upwards of forty thousand of these animals would be annually slain to supply our demand for ivory haubles. But this circumstance is, of course, an extraordinary one; and we only mention it to show the necessary waste of elephant life, in the supply of our commercial wants.

There is a peculiarity in the commerce of elephants' teeth which forcibly arrests the imagination. Ivory is not an article of paramount necessity. The fine marbles would answer the purposes of statuary better, even if the ancient art of sculpture in ivory were restored; and the harder woods are quite as useful in the manufacture of furniture. It is required only for ornaments which are by no means suited to every taste; for modern Europeans have not a passion for ivory, as the Romans are said, by M. de Caylus, to have had. And yet the demand in this country, of which we hear and see little, gives activity to whole tribes of Africans;—makes elephant-hunting a trade;—exposes man to the most appalling dangers, and the severest privations;—and spreads terror amongst thousands of these unoffending animals, who appear to have a natural right, which they have enjoyed from the creation, to the immense savannas upon which they pasture.

the unhappy huntsman with his trunk, flung him up to a vast height in the air, and received him upon one of the tusks as he fell : and then turning towards the other two brothers, as if it were with an aspect of revenge and insult, held out to them the impaled wretch, writhing in the agonies of death.

The teeth of the elephant are what produce the great enmity between him and mankind ; but whether they are shed like the horns of the deer, or whether the animal be killed to obtain them, is not yet perfectly known. All we have as yet certain is, that the natives of Africa, from whence almost all our ivory comes, assure us that they find the greatest part of it in their forests ; nor would, say they, the teeth of an elephant recompense them for their trouble and danger in killing it : notwithstanding, the elephants which are tamed by man are never known to shed their tusks ; and from the hardness of their substance, they seem no way analogous to deer's horns.

The teeth of the elephant are very often found in a fossil state. Some years ago, two great grinding-teeth, and part of the tusk of an elephant, were discovered at the depth of forty-two yards in a lead-mine in Flintshire.¹

The tusks of the mammoth, so often found fossil in Siberia, and which are converted to the purposes of ivory, are generally supposed to belong to the elephant : however, the animal must have been much larger in that country than it is found at present, as those tusks are often known to weigh four hundred pounds ; while those that come from Africa seldom exceed two hundred and fifty. These enormous tusks are found lodged in the sandy banks of the Siberian rivers ; and the natives pretend that they belong to an animal which is four times as large as the elephant.

There have lately been discovered several enormous skeletons, five or six feet beneath the surface, on the banks of the Ohio, not remote from the river Miume, in America, seven hundred miles from the sea-coast. Some of the tusks are near seven feet long ; one foot nine inches in circumference at the base, and one foot near the point ; the cavity at the root or base nineteen inches deep. Besides their size, there are yet other differences : the tusks of the true elephant have sometimes a very slight lateral bend ; these have a larger twist, or spiral curve, towards the smaller end : but the great and specific difference consists

¹ Pennant's Synopsis, p. 90.

in the shape of the grinding-teeth ; which, in these newly found, are fashioned like the teeth of a carnivorous animal ; not flat and ribbed transversely on their surface, like those of the modern elephant, but furnished with a double row of high and conic processes, as if intended to masticate, not to grind their food. A third difference is in the thigh-bone, which is of a great disproportionable thickness to that of the elephant ; and has also some other anatomical variations. These fossil bones have been also found in Peru and the Brazils ; and when cut and polished by the workers in ivory, appear, in every respect similar. It is the opinion of Dr Hunter that they must have belonged to a larger animal than the elephant ; and differing from it in being carnivorous. But as yet this formidable creature has evaded our search ; and if, indeed, such an animal exists, it is happy for man that it keeps at a distance ; since what ravage might not be expected from a creature endued with more than the strength of the elephant, and all the rapacity of a tiger !*

* Fossil elephants have been found in almost every part of the known world, in Europe, Asia, Africa, and not less in America ; in the valleys formed by rivers, and on the high neighbourhood of the Andes, of which the specimens sent to Paris by Humboldt, from Villa d'Ibarra, are examples ; in the scorching regions of the torrid zone, and on the icy shores of the frozen ocean. England, France, and Germany, possess amongst other countries their share of these relics of a former world, as the fossil bones of Kirkdale, Bondi, and the Hartz, amply testify.

They are commonly found in the moveable and superficial beds of the earth, and particularly in those alluvial deposits which fill up the bottom of valleys, or which border the courses of rivers ; they are rarely covered by rocks, and are most frequently accompanied by other fossil bones of known genera of quadrupeds, and often by marine or fresh water shells. With but very few exceptions they are found in unconnected heaps ; but in those situations in which whole skeletons are found, they appear as if were buried in a kind of clay, and in some instances even the skin and flesh are preserved, as in that described by Gabriel Sarytschew, in his voyage along the north-eastern coast of Siberia, and that of Mr Adams, discovered near the mouth of the Lena.

The great depository of elephants' bones, however, appears to be Asiatic Russia, and indeed, so numerous are they that the natives carry on a very extensive trade in the fossil ivory found there, and known by the name of *Mammontorakost*, or mammoth's teeth, which they suppose belong to an animal which they have named the Mammoth, believing it lives like the mole, burrowing under the earth, but dies as soon as it sees the daylight. This curious notion they seem to have held in common with the Chinese ; for a writer of theirs on natural history of the sixteenth century named Bun-zoo-gann-mu, has given a detail of the habits of an animal which he calls *Tienschu*, very closely resembling those ascribed to the mammoth.

CHAP. III.

OF THE RHINOCEROS.

NEXT to the elephant, the rhinoceros is the most powerful of animals. It is usually found twelve feet long from the tip of

The mammoth described by Mr Adams, in the fifth volume of the *Memoire of the Academy of St Petersburg*, was first discovered by a Tongouse fisherman in the year 1799, on the banks of the icy sea, near the mouth of the Lena, in a large misshapen block of ice. In the following year this became separated from the surrounding masses but in the subsequent summer, the ice having melted away one whole side, one tusk of the animal was distinctly visible. The gradual development of this remarkable creature continued from year to year till the fifth after its discovery, when, in consequence of the ice having broken up early, it was drifted ashore, and the fisherman, in the month of March 1801, despoiled it of its tusks, which he sold for fifty rubles. Two years after this, Mr Adams, who was travelling with Count Golovkin's embassy to China, hearing of this at Iakutsk, made a journey to the spot for the purpose of seeing it. He found the skeleton perfect, with the exception of one foot, but the flesh had been given by the natives of Iakutsk to their dogs, and the wild beasts in the neighbourhood had also assisted in consuming what had been left. The greater part of the skeleton was found connected by its natural ligaments, and those bones which were separated were collected in the neighbourhood. The head was covered with a dry skin, the ball of one eye was remaining, and one ear furnished with a tuft of hair. The brain was found dried up in the skull; the neck ornamented with a long mane; the skin covered with black hairs, and reddish kind of fur or wool; and the weight of the skin which remained so great as to require the hard labour of ten men to remove it; besides which, at least thirty pounds of hair were collected from the ground. The animal was a male, and its tusks were nine feet in length. It was purchased by the emperor of Russia for 8000 roubles, and placed by him in the Academy of St Petersburg.

The islands north of Siberia, opposite the coast separating the mouth of the Lena from that of the Indigirka, are so remarkable for the immense quantity of these fossil bones, that the editor of Billings's *Voyage* states, "every island is formed of the bones of this extraordinary animal of the horns and skulls of buffaloes, or animals nearly resembling them, and of some rhinoceros' horns." "*Description*," says Cuvier, "*tres exageree sans doute, mais qui prouve a quel point ces os y sont abondans.*"

In America fossil elephant bones are found, particularly in the state of Kentucky, along the banks of the Ohio, and the most remarkable assemblage are found at Big Bone Lick, which was closely examined by Governor Clarke, and whence numerous specimens were sent by him to Washington. Humboldt also discovered part of a fossil tusk at Villa de Ibarra, in the province of Quito in Peru, a hundred and seventeen toises above the level of the sea.

the nose to the insertion of the tail; from six to seven feet high; and the circumference of its body is nearly equal to its length. It is, therefore, equal to the elephant in bulk: and if it appears much smaller to the eye, the reason is, that its legs

In examining these bones it is a remarkable circumstance, that they very nearly resemble each other in character, from whatever country or climate they may have been brought, and present sufficiently strong characters to determine a new species. Although in height they resemble the Indian or Asiatic elephant, they differ from it in the greater number of laminae forming each molar tooth, and consequently an equal portion being employed in mastication, more laminae are bared. Mr Corse says, that in the Indian elephant, ten or twelve laminae are all which are exposed, but in the Mammoth often as many as twenty-four are seen, and the enamel is less wavyly disposed than in the former. The tusks generally are not more curved than in the Indian elephant, though occasionally they are found to assume an elliptical or semicircular figure; but this may have originated from accidental circumstances, which have caused their growth in such direction as to prevent their being used, and therefore they have by their natural growth acquired this curve; a circumstance frequently observed in our domestic animals, as rats, &c., in which the cuspid teeth having accidentally taken such direction as to prevent their use, continue to grow in a circular manner, so as to prevent the animal opening its mouth. One other and very striking peculiarity is the hair; in this, the Mammoth differs particularly from the Indian or African elephant, in having a strong mane, and in the body being covered with long and short hairs, the former of these from twelve to fifteen inches in length, as thick as a horse's mane, and of a brown colour, whilst the latter are about nine inches long, are finer, and of a yellowish colour, but the roots of both are embedded in a fine, softish, curly, bright yellow wool, which covers a deep grey skin. This covering of hair evidently proves that the animal was intended for a cold climate; and by what means its bones have been conveyed into the regions of South America, where such warm clothing was not required, save by allowing the occurrence of some great convulsion of nature, and that by water, it would be difficult to account.

In 1826, Mr Ranking published a very amusing and interesting work, entitled *Historical Researches on the Wars and Sports of the Mongols and Romans*, in which he has taken great pains to prove that the fossil bones of elephants, and other animals so frequently found, are the remains of those animals which were slaughtered in the grand hunting parties of the former, or the amphitheatrical exhibitions of the latter; and in support of that part of his opinion which relates to the Romans, he shows, that in almost every instance where the remains of a theatre have been found, there have been also discovered fossil bones in the neighbourhood. That to a certain extent this is true no one can doubt, and even Cuvier himself readily admits it, but with this difference, that such fossil bones are found in a more recent soil; whilst the remains of Blumenbach's *E. Primigenius* are deposited in a soil of much more ancient existence; and the bones themselves differ in many very remarkable points from those of the present known species. In the course of his work, Mr Ranking also speaks of the great collection of fossil

are much shorter. Words can convey but a very confused idea of this animal's shape; and yet there are few so remarkably formed: its head is furnished with a horn, growing from the snout, sometimes three feet and a half long; and but for this, that part would have the appearance of the head of a hog; the upper lip, however, is much longer in proportion, ends in a point, is very pliable, serves to collect its food, and deliver it into the mouth: the ears are large, erect, and pointed; the eyes are small and piercing; the skin is naked, rough, knotty, and lying upon the body in folds, after a very peculiar fashion: there are two folds very remarkable; one above the shoulders, and another over the rump: the skin, which is of a dirty brown colour, is so thick as to turn the edge of a scimitar, and to resist a musket-ball; the belly hangs low; the legs are short, strong, and thick, and the hoofs divided into three parts, each pointing forward.

Such is the general outline of an animal that appears chiefly formidable from the horn growing from its snout; and formed rather for war than with a propensity to engage. This horn is sometimes found from three to three feet and a half long, growing from the solid bone, and so disposed as to be managed to the greatest advantage. It is composed of the most solid substance; and pointed so as to inflict the most fatal wounds. The elephant, the boar, or the buffalo, are obliged to strike transversely with their weapons; but the rhinoceros employs all his force with every blow; so that the tiger will more willingly attack any other animal of the forest, than one whose strength is so justly employed. Indeed, there is no force which this terrible animal has to apprehend. defended on every side, by a thick horny hide, which the claws of the lion or the tiger are unable to pierce, and armed before with a weapon that even the elephant does not choose to oppose. The missionaries assure us, that the elephant is often found dead in the forests, pierced with the horn of a rhinoceros; and though it looks like wisdom

bones already mentioned as being found on the coasts of Siberia, which he unhesitatingly states to belong to the *Trichechus Rosmarus*, or *Walrus*, an animal which in every respect differs from the bones found there. And when he refers to the elephant discovered at the mouth of the Lerna, the authenticity of which, from its skeleton being found almost entirely connected, he cannot disallow, he states, that it was probably one of those which Genghis Khan sent to his Siberian relatives, and, not improbably, was destroyed by a sudden irruption of the sea.

to doubt whatever they tell us, yet I cannot help giving credit to what they relate on this occasion, particularly when confirmed by Pliny. The combat between these two, the most formidable animals of the forest, must be very dreadful. Emanuel, king of Portugal, willing to try their strength, actually opposed them to each other; and the elephant was defeated.

But though the rhinoceros is thus formidable by nature, yet imagination has not failed to exert itself, in adding to its terrors. The scent is said to be most exquisite; and it is affirmed that it consorts with the tiger. It is reported also, that when it has overturned a man, or any other animal, it continues to lick the flesh quite from the bone with its tongue, which is said to be extremely rough. All this, however, is fabulous: the scent, if we may judge from the expansion of the olfactory nerves, is not greater than that of a hog, which we know to be indifferent; it keeps company with the tiger, only because they both frequent watery places in the burning climates where they are bred; and as to its rough tongue, that is so far from the truth, that no animal of near its size has so soft a one. "I have often felt it myself," says *Ladvocat*, in his description of this animal; "it is smooth, soft, and small, like that of a dog; and to the feel it appears as if one passed the hand over velvet; I have often seen it lick a young man's face who kept it, and both seemed pleased with the action."

The rhinoceros which was shown at London in 1739, and described by *Dr Parsons*, had been sent from Bengal. Though it was very young, not being above two years old, yet the charge of its carriage and food from India cost near a thousand pounds. It was fed with rice, sugar, and hay: it was daily supplied with seven pounds of rice, mixed with three of sugar, divided into three portions; it was given great quantities of hay and grass, which it chiefly preferred; its drink was water, which it took in great quantities. It was of a gentle disposition, and permitted itself to be touched and handled by all visitors, never attempting mischief, except when abused, or when hungry; in such a case there was no method of appeasing its fury but by giving it something to eat. When angry, it would jump up against the walls of its room with great violence, and made many efforts to escape, but seldom attempted to attack its keeper, and was always submissive to his threats. It had a peculiar cry, somewhat a

mixture between the grunting of a hog and the bellowing of a calf.*

The age of these animals is not well known; it is said by some, that they bring forth at three years old; and if we may reason from analogy, it is probable they seldom live till above twenty. That which was shown in London was said by its keeper to be eighteen years old, and even at that age he pretend-

* The natural history of the rhinoceros has been rendered more complete by Mr Thomas's anatomical description of a male animal of this singular species, which had been brought to this country alive from the East Indies. This creature appeared to enjoy good health until a few days before his death, when he was attacked with difficulty of breathing. He had not probably arrived at full growth, for he was scarcely so high as a heifer of two years old, and the horn, which is affixed to the upper lip of the adult rhinoceros, was here just beginning to sprout. The disease had carried him off before he had attained his third year. In the course of this time he had become perfectly tame and docile; but did not manifest the smallest attachment to his keeper. His food was chiefly hay, oats, and potatoes, and also fresh vegetables; his consumption of which was greater than that of two or three working horses. Mr T. found that the general structure of this animal corresponded with what is observed in the horse, but that there were the following peculiarities:—The skin, it is well known, is extremely hard and tuberculated, though smoother, and easily cut through with a common knife on the under part of the body; a considerable deal of sliding motion was observable between it and the surface underneath. With respect to the teeth, the incisors were only four in number, two situated in each jaw, and these were placed at a great distance from each other. In the head of another rhinoceros (five years old) seen by Mr T. and where the soft parts had been removed, there were two smaller teeth placed, one on each side of those in the lower jaw. The *molars* were only eight in number. Their form had been noticed by Mr Horne in the Philosophical Transactions for 1799. But the most remarkable peculiarity in the anatomy of the animal is the connexion of four processes, arising by distinct tendons from the internal and posterior portion of the sclerotic coat, with the choroid coat of the one at its broadest diameter. These processes have a muscular appearance, and would seem to have the effect, when acting conjointly, of adapting the organ to the cognizance of more distinct objects; for at their terminations they completely encircle the eye, and may therefore, by contracting, shorten the axis of vision, and bring the retina nearer to the crystalline lens.

The lens itself is of a singular form, being nearly spherical, with the anterior surface a little flattened.

The *pigmentum nigrum* was found to be confined to the inside of the choroid coat, without any structure similar to the *lapidum lundum*. Notwithstanding the opinion generally entertained, of the rhinoceros having bad sight, Mr T. is led to conclude from his examination of the several appendages of that organ, that the animal is not only not deficient in quickness of vision, but that he may perhaps be superior to other animals in that particular.

ed to consider it as a young one ; however, it died shortly after, and that probably in the course of nature.

The rhinoceros is a native of the deserts of Asia and Africa, and is usually found in those extensive forests that are frequented by the elephant and the lion. As it subsists entirely upon vegetable food, it is peaceful and harmless among its fellows of the brute creation ; but, though it never provokes to combat, it equally disdains to fly. It is every way fitted for war, but rests content in the consciousness of its security. It is particularly fond of the prickly branches of trees, and is seen to feed upon such thorny shrubs as would be dangerous to other animals, either to gather or to swallow. The prickly points of these, however, may only serve to give a poignant relish to this animal's palate, and may answer the same grateful ends in seasoning its banquet that spices do in heightening ours.

In some parts of the kingdom of Asia, where the natives are more desirous of appearing warlike than showing themselves brave, these animals are tamed, and led into the field to strike terror into the enemy ; but they are always an unmanageable and restive animal, and probably more dangerous to the employers than those whom they are brought to oppose.

The method of taking them is chiefly watching them, till they are found either in some moist or marshy place, where, like hogs, they are fond of sleeping and wallowing. They then destroy the old one with fire-arms ; for no weapons that are thrown by the force of men are capable of entering this animal's hide. If, when the old one is destroyed, there happens to be a cub, they seize and tame it : these animals are sometimes taken in pit-falls covered with green branches, laid in those paths which the rhinoceros makes in going from the forest to the river side.

There are some varieties in this animal, as in most others ; some of them are found in Africa with a double horn, one growing above the other.* This weapon, if considered in itself, is

* *The two horned rhinoceros.*—This species of the rhinoceros differs from the other in the appearance of its skin ; which instead of vast and regularly marked folds, resembling armour, has merely a slight wrinkle across the shoulders and the hinder parts, with a few fainter wrinkles on the sides ; so that, in comparison with the common rhinoceros, it appears almost smooth. The principal distinction, however, consists in the nose being furnished with two horns, one of which is smaller than the other, and situated above it. These horns are said to be loose when the animal is in a quiet state, but

one of the strongest and most dangerous that nature furnishes to any part of the animal creation. The horn is entirely solid, formed of the hardest bony substance, growing from the upper maxillary bone, by so strong an apophyse, as seemingly to make

when he is angry, they become firm and immoveable. Le Vaillant asserts, that when these animals are at rest, they always place themselves in the direction of the wind, with their noses towards it, in order to discover by their smell the approach of any enemies. When irritated they tear up the ground furiously with their horns, throwing the earth and stones to a vast distance over their heads.

Mr Bruce's account of these animals is interesting.—“Besides the trees capable of most resistance,” says this traveller, “there are in the vast forests within the rains, trees of a softer consistence, and of a very succulent quality, which seem to be destined for the principal food of this animal. For the purpose of gaining the highest branches of these trees, his upper lip is capable of being lengthened out so as to increase his power of laying hold of it, in the same manner as the elephant does with his trunk.—With this lip, and the assistance of his tongue, he pulls down the upper branches, which have most leaves, and these he devours first. Having stripped the tree of its branches, he does not immediately abandon it; but, placing his snout as low in the trunk as he finds his horns will enter, he rips up the body of the tree, and reduces it to thin pieces like so many laths; and when he has thus prepared it, he embraces as much of it as he can in his monstrous jaws, and twists it round with as much ease as an ox would a root of celery, or any small plant. When pursued, and in fear, he possesses an astonishing degree of swiftness, considering his size, the apparent unwieldiness of his body, his great weight before, and the shortness of his legs. He has a kind of trot, which, after a few minutes, increases in a great proportion, and takes in a considerable distance; but this is to be understood with a degree of moderation. It is not true, that in a plain he beats the horse in swiftness. I have passed him with ease, and seen many worse mounted do the same: and though it is certainly true that a horse can very seldom come up with him, this is owing to his cunning, and not to his swiftness. He makes constantly from wood to wood, and forces himself into the thickest parts of them. The trees that are dead or dry, are broken down, as with a cannon shot, and fall behind him and on his sides in all directions. Others that are more pliable, greener, or fuller of sap, are bent back by his weight and the velocity of his motions. And after he has passed, restoring themselves like a green branch to their natural position, they often sweep the incautious pursuer and his horse from the ground, and dash them in pieces against the surrounding trees. The eyes of the rhinoceros are very small; he seldom turns his head, and therefore sees nothing but what is before him. To this he owes his death, and never escapes if there is so much plain as to enable the horse to get before him. His pride and fury then make him lay aside all thoughts of escaping, but by victory over his enemy. He stands for a moment at bay, then, at a start, runs straight forward at the horse, like the wild boar, which, in his manner of action, he very much resembles. The horse, however, easily avoids him by turning short to one side, and this is the fatal instant: the naked man, with the sword, drops from behind the principal horseman, and,

but one part with it. Many are the medicinal virtues that are ascribed to this horn, when taken in powder; but these qualities have been attributed to it without any real foundation, and make only a small part of the many fables which this extraordinary animal has given rise to.*

unseen by the rhinoceros, who is seeking his enemy the horse, he gives him a stroke across the tendon of the heel, which renders him incapable of further flight or resistance."

The double horned rhinoceros has a formidable adversary in a fly; and this insect persecutes him so unremittingly, that it must eventually subdue him, were it not for a stratagem which he practises for his preservation. In the night, when the fly is at rest, the rhinoceros chooses a convenient place, and there rolling in the mud, clothes himself with a kind of case, which defends him against his adversary the following day. The wrinkles and plaits of his skin serve to keep this plaster firm upon him, all but about the hips, shoulders, and legs, where it cracks and falls off, by motion, and leaves him exposed in those parts. The itching and pain which follow, occasion him to rub himself in those parts against the roughest trees; and this is probably one cause of the numerous pustules or tubercles that are perceivable upon his skin. The pleasure he receives from this employment, and the darkness of the night, deprive him of his usual vigilance and attention; and the noise he makes is heard at so considerable a distance, that the hunters, guided by this sound, steal secretly upon him; and while lying on the ground, wound him with their javelins in the belly, where the wound is mortal.

The assertion that the skin of this rhinoceros is hard or impenetrable, like a board, is very incorrect. In his wild state he is slain by javelins thrown from the hand, some of which enter his body to a great depth. A musket shot will go through him, unless interrupted by a bone; and the Abyssinians kill him with the clumsiest arrows that ever were formed, and cut him to pieces afterwards with the most wretched knives.

Mr Sparrman informs us, that having opened one of these animals, he found the stomach to be four feet in length and two in diameter, to which was annexed a tube or canal, twenty-eight feet long, and six inches diameter; the heart was eighteen inches in length, and the kidneys the same in breadth: the liver, when measured from right to left, was three feet and a half in breadth, and about thirty inches deep, as it hangs in the animal's body when in a standing position. The cavity in the skull, which contained the brains, was, however, but small, being only six inches long and four deep.

The Hottentots ascribe many medicinal virtues to the dried blood of the rhinoceros; and some of them appear remarkably fond of its flesh, though it is hard and full of sinews.

* *The Sukotyro*—Is an animal of a new genus; only one species has been yet discovered, and is termed by naturalists the Javan Sukotyro. It has a horn on each side of the head close to the orbits, and is furnished with a short, narrow, upright mane, along the back; which extends from the back of the head to the rump.

The sukotyro is an inhabitant of the island of JAVA; it is thus named by

CHAP. IV.

THE HIPPOPOTAMUS.

THE Hippopotamus is an animal as large, and not less formidable, than the rhinoceros ; its legs are shorter, and its head rather more bulky than that of the animal last described. We have had but few opportunities in Europe of examining this formidable creature minutely ; its dimensions, however, have been pretty well ascertained, by a description given us by Zerenghi, an Italian surgeon, who procured one of them to be killed on the banks of the river Nile. By his account it appears, that this terrible animal, which chiefly resides in the waters of that river, is above seventeen feet long from the extremity of the snout to the insertion of the tail ; above sixteen feet in circumference round the body, and above seven feet high : the head is near four feet long, and above nine feet in circumference. The jaws open about two feet wide, and the cutting-teeth, of which it hath four in each jaw, are above a foot long.

Its feet, in some measure, resemble those of the elephant, and are divided into four parts. The tail is short, flat, and pointed ; the hide is amazingly thick, and though not capable of turning a musket-ball, is impenetrable to the blow of a sabre ; the body is covered over with a few scattered hairs of a whitish colour. The whole figure of the animal is something between that of an ox and a hog, and its cry is something between the bellowing of the one and the grunting of the other.

This animal, however, though so terribly furnished for war, seems no way disposed to make use of its prodigious strength against an equal enemy ; it chiefly resides at the bottom of the great rivers and lakes of Africa, the Nile, the Niger, and the Chinese. It is a very odd shaped beast ; it is of the bigness of a large ox, with a snout like a hog, having two long rough ears, and thick bushy tail ; the eyes are placed upright in the head, quite different from other beasts ; on the sides of the head, next to the eyes, stand two long horns, or rather tusks, not quite so thick as those of the elephant. The feet are each armed with four knobs, or half hoofs, on their fore parts ; the nose is very broad, and truncated ; the ears very large, and slouching ; the tail covered with flowing hairs, and reaches lower than the middle of the hind legs ; the skin is smooth, and entirely free from plaits, like those on the one-horned rhinoceros. It feeds on herbage and is but seldom taken.

Zara ; there it leads an indolent kind of life, and seems seldom disposed for action, except when excited by the calls of hunger. Upon such occasions, three or four of them are often seen at the bottom of a river, near some cataract, forming a kind of line, and seizing upon such fish as are forced down by the violence of the stream. In that element they pursue their prey with great swiftness and perseverance ; they swim with much force, and remain at the bottom for thirty or forty minutes, without rising to take breath. They traverse the bottom of the stream, as if walking upon land, and make a terrible devastation where they find plenty of prey. But it often happens, that this animal's fishy food is not supplied in sufficient abundance ; it is then forced to come upon land, where it is an awkward and unwieldy stranger ; it moves but slowly, and as it seldom forsakes the margin of the river, it sinks at every step it takes ; sometimes, however, it is forced by famine up into the higher grounds, where it commits dreadful havoc among the plantations of the helpless natives, who see their possessions destroyed, without daring to resist their invader. Their chief method is by lighting fires, striking drums, and raising a cry to frighten it back to its favourite element ; and as it is extremely timorous upon land, they generally succeed in their endeavours. But if they happen to wound, or otherwise irritate it too closely, it then becomes formidable to all that oppose it : it overturns whatever it meets, and brings forth all its strength, which it seemed not to have discovered before that dangerous occasion. It possesses the same inoffensive disposition in its favourite element, that it is found to have upon land ; it is never found to attack the mariners in their boats as they go up or down the stream ; but should they inadvertently strike against it, or otherwise disturb its repose, there is much danger of its sending them at once to the bottom. " I have seen," says a mariner, as we find it in *Damier*, " one of these animals open its jaw, and seizing a boat between its teeth, at once bite and sink it to the bottom. I have seen it, upon another occasion, place itself under one of our boats, and, rising under it, upset it, with six men who were in it ; who, however, happily received no other injury." Such is the great strength of this animal ; and from hence, probably, the imagination has been willing to match it in combat against others more fierce, and equally formidable. The crocodile and

shark have been said to engage with it, and yield an easy victory ; but as the shark is only found at sea, and the hippopotamus never ventures beyond the mouth of fresh-water rivers, it is most probable that these engagements never occurred ; it sometimes happens, indeed, that the princes of Africa amuse themselves with combats, on their fresh-water lakes, between this and other formidable animals ; but whether the rhinoceros or the crocodile are of this number we have not been particularly informed. If this animal be attacked on land, and find itself incapable of vengeance from the swiftness of its enemy, it immediately returns to the river, where it plunges in head foremost, and, after a short time, rises to the surface, loudly bellowing, either to invite or intimidate the enemy ; but though the negroes will venture to attack the shark or the crocodile in their natural element, and there destroy them, they are too well apprised of the force of the hippopotamus to engage it ; this animal, therefore, continues the uncontrolled master of the river, and all others fly from its approach, or become an easy prey.

As the hippopotamus lives upon fish and vegetables, so it is probable the flesh of terrestrial animals may be equally grateful : the natives of Africa assert, that it has often been found to devour children and other creatures that it was able to surprise upon land ; yet, as it moves but slowly, almost every creature, endued with a common share of swiftness, is able to escape it ; and this animal, therefore, seldom ventures from the river side, but when pressed by the necessities of hunger, or of bringing forth its young.

The female always comes upon land to bring forth, and it is supposed that she seldom produces above one at a time. Upon this occasion these animals are particularly timorous, and dread the approach of a terrestrial enemy ; the instant the parent hears the slightest noise it dashes into the stream, and the young one is seen to follow it with equal alacrity.

The young ones are said to be excellent eating ; but the negroes, to whom nothing that has life comes amiss, find an equal delicacy in the old. Dr Pococke has seen their flesh sold in the shambles like beef ; and it is said that their breast, in particular, is as delicate eating as veal. As for the rest, these animals are found in great numbers, and as they produce very fast, their flesh might supply the countries where they are found, could

those barbarous regions produce more expert huntsmen. It may be remarked, however, that this creature, which was once in such plenty at the mouth of the Nile, is now wholly unknown in Lower Egypt, and is no where to be found in that river, except above the cataracts.

CHAP. V.

THE CAMELOPARD.

WERE we to be told of an animal so tall, that a man on horse-back could with ease ride under its belly, without stooping, we should hardly give credit to the relation ; yet of this extraordinary size is the camelopard, an animal that inhabits the deserts of Africa, and the accounts of which are so well ascertained, that we cannot deny our assent to their authority. It is no easy matter to form an adequate idea of this creature's size, and the oddity of its formation. It exhibits somewhat the slender shape of the deer, or the camel, but destitute of their symmetry, or their easy power of motion. The head somewhat resembles that of the deer, with two round horns, near a foot long, and which, it is probable, it sheds as deer are found to do ; its neck resembles that of a horse ; its legs and feet those of the deer, but with this extraordinary difference, that the fore-legs are near twice as long as the hinder. As these creatures have been found eighteen feet high, and ten from the ground to the top of the shoulder, so allowing three feet, for the depth of the body, seven feet remains, which is high enough to admit a man mounted on a middle-sized horse. The hinder part, however, is much lower, so that when the animal appears standing, at rest, it has somewhat the appearance of a dog sitting ; and this formation of its legs gives it an awkward and a laborious motion, which, though swift, must yet be tiresome. For this reason the camelopard is an animal very rarely found, and only finds refuge in the most internal desert regions of Africa. The dimensions of a young one, as they were accurately taken by a person who examined its skin, that was brought from the Cape of Good Hope, were found to be as follow : the length of the head was one foot eight

inches ; the height of the fore-leg, from the ground to the top of the shoulder, was ten feet ; from the shoulder to the top of the head was seven ; the height of the hind-leg was eight feet five inches ; and from the top of the shoulder to the insertion of the tail was just seven feet long.

No animal, either from its disposition, or its formation, seems less fitted for a state of natural hostility ; its horns are blunt, and even knobbed at the ends ; its teeth are made entirely for vegetable pasture ; its skin is beautifully speckled with brown spots, upon a whitish ground ; it is timorous and harmless, and, notwithstanding its great size, rather flies from, than resists, the slightest enemy ; it partakes very much of the nature of the camel, which it so nearly resembles ; it lives entirely upon vegetables, and when grazing, is obliged to spread its fore-legs very wide in order to reach its pasture ; its motion is a kind of pace, two legs on each side moving at the same time, whereas in other animals they move transversely. It often lies down with its belly to the earth, and, like the camel, has a callous substance upon its breast, which, when reposed, defends it from injury. This animal was known to the ancients, but has been very rarely seen in Europe. One of them was sent from the East to the Emperor of Germany, in the year 1559 ; but they have often been seen tame at Grand Cairo in Egypt ; and, I am told, there are two there at present. When ancient Rome was in its splendour, Pompey exhibited at one time no less than ten upon the theatre. It was the barbarous pleasure of the people, at that time, to see the most terrible, and the most extraordinary animals, produced in combat against each other. The lion, the lynx, the tiger, the elephant, the hippopotamus, were all let loose promiscuously, and were seen to inflict indiscriminate destruction.*

* The absence of the camelopard or giraffe from Europe, for three centuries and a half, naturally induced a belief that the descriptions of this animal were in great part fabulous—that a creature of such extraordinary height and apparent disproportions was not to be found amongst the actual works of nature ; and that it more properly belonged to the group of chimeras with which the regions of imagination are tenanted,—the unicorn, and sphinxes, and satyrs, and cynocephali, of ancient poets and naturalists.

Buffon, and other zoologists, fell into the common error of describing the giraffe as having his fore legs twice as long as his hind. It was not till within the last forty years that we obtained any very precise notions of the form and habits of the giraffe ; and we principally owe them to *Le Vaillant*,

CHAP. VI.

THE CAMEL AND THE DROMEDARY ¹

THESE names do not make two distinct kinds, but are only given to a variety of the same animal, which has, however, sub-

whose narrative was, indeed, originally considered, in some degree, fabulous, but the correctness of whose statements, in this particular, has since been abundantly confirmed.

We shall be enabled to describe the appearance and the habits of the giraffe somewhat minutely, as they have been observed in the menageries of the kings of England and of France. But Le Vaillant saw the animal in its natural state; and we may, therefore, properly translate a part of his description.

"The giraffe ruminates, as every animal does that possesses, at the same time, horns and cloven feet. It grazes also in the same way; but not often, because the country which it inhabits has little pasturage. Its ordinary food is the leaf of a sort of mimosa, called by the natives *kunaap*, and by the colonists, *kameel-doorn*. This tree being only found in the country of the Namaquas, may probably afford a reason why the giraffe is there fixed, and why he is not seen in those regions of Southern Africa where the tree does not grow. Doubtless, the most beautiful part of his body is the head. The mouth is small; the eyes are brilliant, and full. Between the eyes, and above the nose, is a swelling, very prominent and well defined. This prominence is not a fleshy excrescence, but an enlargement of the bony substance; and it seems to be similar to the two little lumps, or protuberances, with which the top of his head is armed, and which, being about the size of a hen's egg, spring, on each side, at the commencement of the mane. His tongue is rough, and terminates in a point. The two jaws have, on each side, six molar teeth; but the lower jaw has, beyond these, eight incisive teeth, while the upper jaw has none. The hoofs, which are cleft, and have no nails, resemble those of the ox. We may remark, at first sight, that those of the fore feet are larger than those of the hind. The leg is very slender, but the knees have a prominence, because the animal kneels when he lies down. There is also a larger callosity on the breast, which would lead one to conclude that he generally rests on that part.

"If I had not myself killed the giraffe, I should have believed, as have many naturalists, that the fore legs are much longer than the hind. This is an error; for the legs have, in general, the proportion of those of other quadrupeds. I say in general, because in this genus there are varieties, as there are in animals of the same species. Thus, for example, mares are lower before than stallions of an equal height. What has led to this error, as to the difference between the legs of the giraffe, is the height of the with-

I These quadrupeds have six front teeth in the lower jaw, which are rather thin and broad: the canine teeth are a little remote from the rest; in the upper jaw there are three, in the lower two: the upper lip divided; and there are no horns.

sisted time immemorial. The principal, and perhaps the only sensible difference, by which those two races are distinguished, consists in this, that the camel has two bunches upon his back, whereas the dromedary has but one; the latter, also, is neither

ers, which, according to the animal's age, may exceed the height of the rump by sixteen or twenty inches, and which disproportion, when we see it at a distance, must have led to the belief that its legs are longer before than behind. . . . His defence, as that of the horse and other hoofed animals, consists in kicks; and his hinder limbs are so light, and his blows so rapid, that the eye cannot follow them. They are sufficient for his defence against the lion. He never employs his horns in resisting any attack. . . . The giraffes, male and female, resemble each other in their exterior, in their youth. Their obtuse horns are then terminated by a knot of long hair: the female preserves this peculiarity some time, but the male loses it at the age of three years. The hide, which is at first of a light red, becomes of a deeper colour as the animal advances in age, and is at length of a yellow brown in the female, and of a brown approaching to black in the male. By this difference of colour the male may be distinguished from the female at a distance. The skin varies in both sexes, as to the distribution and form of the spots. The female is not so high as the male, and the prominence of the front is not so marked. She has four teats. According to the account of the natives, she goes with young about twelve months, and has one at a birth."

The giraffe which died lately in the king's menagerie at Windsor arrived in England in August 1827, and was a present from the Pasha of Egypt to his Majesty. About the same period another giraffe arrived at Marseilles, being also a present from the Pasha of Egypt to the king of France. That animal was conveyed to the Jardin des Plantes, and for several months occupied almost the exclusive attention of the lively Parisians. Every fashion was *a la giraffe*; and even the ladies wore dresses, and the men carried handkerchiefs, bearing the portrait of the animal. Both of these individuals were females; and they were each taken very young by some Arabs, who fed them with milk. The governor of Sennaar, a large town of Nubia, obtained them from the Arabs, and forwarded them to the Pasha of Egypt. This ruler determined on presenting them to the kings of England and France; and as there was some difference in size, the consuls of each nation drew lots for them. The shortest and weakest fell to the lot of England. The giraffe destined for our sovereign was conveyed to Malta, under the charge of two Arabs, and was from thence forwarded to London in the Penelope merchant vessel, and arrived on the 11th of August. The animal was conveyed to Windsor, two days after, in a spacious caravan. The following were its dimensions, as measured shortly after its arrival at Windsor:—

	Ft.	In.
From the top of the head to the bottom of the hoof	10	8
Length of the head	1	9
From the top of the head to the neck root	4	0
— neck root to the elbow	2	3
— elbow to the upper part of the knee	1	8
— upper part of the knee to the fetlock joint	1	11
— fetlock joint to the bottom of the hoof	0	10

so large, nor so strong, as the camel. These two races, however, produce with each other, and the mixed breed formed between them is considered the best, the most patient, and the most indefatigable of all the kind.

Of the two varieties, the dromedary is by far the most numerous, the camel being scarcely found, except in Turkey, and the countries of the Levant; while the other is found spread over all the deserts of Arabia, the southern parts of Africa, Persia, Tartary, and a great part of the eastern Indies.* Thus, the

	Ft.	In.
Length of the back	3	1
From the croup to the bottom of the hoof	5	8
— hough to the bottom of the hoof	2	9
Length of the hoofs	0	7½

She grew somewhat after her arrival, but her health was never good. Her joints appeared to *shoot over*, and she was very weak and crippled. Indeed, so great was the weakness of her fore-legs, that a pulley was constructed, being suspended from the ceiling of her hovel, and fastened round her body, for the purpose of raising her on her legs without any exertion on her part. When she first arrived, she was exceedingly playful, and perfectly harmless; but she became afterwards much less active, although as gentle as before. She appeared to know her keeper, and every object by which she was surrounded attracted her attention.

* The term dromedary properly applies to a very swift species of camel. The name *καμηλος δρομος* (fleet camel) was given by Strabo and Diodorus Siculus to a single race of the species, of great speed, now called by the Arabs *el heirie*. Obtaining the word dromedary from *dromas*, we have popularly, and even scientifically, applied it to the species. A dromedary is to a camel, what a racer is to a horse of burden. There are one-humped and two-humped dromedaries, and one-humped and two-humped camels.

The lean and almost fleshless body of the camel is covered with hair, which is very short on the forepart of the muzzle: this becomes longer on the top of the head, and almost tufty on the neck and parts of the fore-legs, on the back, and particularly on the hump, which it covers all over. The tail is also thick with hair, which extends considerably beyond the vertebrae. The colour of the hair varies: it is either white, with a slight tint of rose colour, grey, bay, or dark brown, approaching to black. The hair falls off and is renewed every year about the end of spring and the commencement of summer.

At Pisa, in Italy, camels have been reared for two centuries. Of these M. Santi has published an interesting memoir. He describes the peculiar excitation of the camel for about two months of the year—February and March. During this period these patient and gentle creatures, particularly the male, become restless and ferocious; will bite their keepers; and fight amongst themselves with their teeth and feet.

The female camel goes with young between eleven and twelve months, at the end of which time she has one foal. There has been no example at Pisa of more than one being produced at a birth. The little one is at first unable

one inhabits an immense tract of country, the other, in comparison, is confined to a province; the one inhabits the sultry countries of the torrid zone, the other delights in a warm, but not a burning climate; neither, however, can subsist, or propagate, in

to stand upon its legs; and, as the mother will not stoop so as to allow it to suck, it would perish with hunger if the keeper did not lift it up to receive the nourishment which nature has provided. This assistance is rendered to the helpless creature for five or six days, during which time it acquires strength to stand upon its legs. We can find no account of the camels of the East which mentions this circumstance; it may perhaps be an evidence of the degeneration of the species in Europe. It is probable, however, that the Arabs, who are distinguished for their extreme care of their camels and horses, may afford the same aid to the young, although the fact has not been noticed. In a wild state, it is evident that the dam must stoop, or the young camel stand up to suck; if otherwise, the race could not be continued.

During the winter, the working camels of Pisa are fed with hay, in large stables; but during the remainder of the year they are turned out to pasture with the rest, who remain without shelter during all seasons. The green and tender grass, which other cattle eat with so much avidity, is neglected by these camels; but they greedily devour the leaves of the oak, of the cork-oak, and of the alder, and feed with manifest delight on every hard and dry substance which they can find, such as the thorn, the thistle, and the broom. They drink only once a-day.

Of the mode of breaking and training the camel by the people of the East, we have no complete account. M. Santi supplies this information, with regard to those of Tuscany. At the age of four years, a camel which is intended for labour is broken in. The trainers first double up one of his fore-legs, which they tie fast with a cord; they then pull the cord, and thus usually compel the animal to fall upon his bent knee. If this does not succeed, they tie up both legs, and he falls upon both knees, and upon the callosity which is upon his breast. They often accompany this operation with a particular cry, and with a slight blow of a whip. At this cry and blow, with the addition of a sudden jerk downwards of his halter, the camel gradually learns to lie down upon his belly, with his legs doubled under him, at the command of his driver. The trainers then accustom him to a pack-saddle, and place on it a load, at first light, but increased by degrees, as the animal increases in docility; till at last, when he readily lies down at the voice of his driver, and as readily rises up with his load, his education is so far complete. The burthen of a full-grown camel of Pisa is sometimes four hundred kilogrammes (above 800 lbs.), but such a load, if we may judge by other accounts, is excessive.

He is accustomed, in the same gradual manner, to allow his driver to mount, and to obey all his orders, and even his motions, in the direction of his course. M. Santi says, that it is neither a tedious nor a difficult task thus to subdue an animal of a timid and gentle nature, without defence, and whose spirit has been broken by a long course of slavery. The camels of Pisa, he adds, do not complain with their voices if too heavily laden; but it would appear that the experience and humanity of the Tuscan guides prevent the necessity for this complaint as they know that the camel would not, or

the variable climates towards the north ; they seem formed for those countries where shrubs are plenty, and water scarce ; where they can travel along the sandy desert without being impeded by rivers, and find food at expected distances ; such a country is

rather could not, rise, if thus overburthened. In the East, however, the camel is sometimes oppressed by the loads which are placed upon him, when he is kneeling before his driver, and he expresses his displeasure. M. Denon, who travelled in Egypt during the expedition of Napoleon, and published a splendid work illustrative of the manners and antiquities of the country, has given us a spirited sketch of a camel thus suffering and irritated. "He cries out," says M. Denon, "when he is either laden too heavy or laden unequally. This good animal complains only of injustice, and then it must be extreme for him to complain at all."

The camel has seven callosities, upon which he throws the weight of his body, both in kneeling down and rising up. These consist of one on the breast, two on each of the fore-legs, and one on each of the hind. He sleeps always with his knees bent under his body, and his breast upon the ground. Some naturalists have contended that these callosities are produced by the constant friction to which the parts are exposed upon which they grow, in the same way that a tight shoe will produce a corn. M. Santi saw these seven callosities upon a camel just born ; and he is unwilling to believe that they are an hereditary effect of the labour to which the species has been subjected for many centuries. This is an opinion which these naturalists have adopted, and it has been echoed by historians : Gibbon says the camel bears marks of servitude. For the same reason, that he is born with it, M. Santi doubts the opinion that has also been expressed, that the hump on the back of the camel is an hereditary effect of constant pressure upon that part. We are only acquainted with the domesticated camel : for although M. Desmoulins, a distinguished French naturalist, asserts that the camel existed in a wild state in Arabia, in the time of Adrian (A. D. 117), and the natives of central Africa maintain that they are to be found wild in the mountains where Europeans have never penetrated, it is highly probable that these statements refer to individual camels wandering from the control of man. We know nothing distinctly of the camel, but as one of the most useful and important servants of the human race ; and, therefore, we have no means of contrasting a wild with a domesticated species. But, in the absence of positive evidence to the contrary, it is more easy to believe that the original organization of the camel should have been adapted to the services to which it is destined, than that the services should have altered the organization. The callosities enable the animal to receive its load, (in the only position in which man could put on that load,) by preventing the fracture of its skin by the pressure, either when it rises up or kneels down ; and the hump on the back is so far from being a callosity produced by friction, that it is a soft, fatty substance, which is gradually absorbed into the system when the animal is without food, and is renewed when he obtains pasturage,—an evident proof that it is one of the several admirable provisions which he possesses for his support in the desert. We could as readily believe that the wonderful mechanism of the camel's stomach, by which it is enabled to abstain from water for many days, is a result of its habits, instead of its powers of abstinence being a consequence of this construction,—as that its hump and

Arabia, and this, of all others, seems the most adapted to the support and production of this animal.

The camel is the most temperate of all animals, and it can continue to travel several days without drinking. In those vast deserts, where the earth is everywhere dry and sandy, where there are neither birds nor beasts, neither insects nor vegetables, where nothing is to be seen but hills of sand and heaps of stone, there the camel travels, posting forward, without requiring either drink or pasture, and is often found six or seven days without any sustenance whatsoever. Its feet are formed for travelling upon sand, and utterly unfit for moist or marshy places; the inhabitants, therefore, find a most useful assistant in this animal, where no other could subsist, and by its means cross those deserts with safety, which would be unpassable by any other method of conveyance.

An animal, thus formed for a sandy and desert region, cannot

its callosities are merely hereditary badges of its subjection to man; and yet this opinion, monstrous as it is, has been adopted by a distinguished naturalist—as we shall have occasion more particularly to notice.

The uses which the camel has served in the civilization of mankind, in those countries of the East where civilization first commenced, have been of such importance, that they would fairly enter into the scheme of a wise and beneficent Providence. Unless such an animal had existed in Asia, (a country intersected by immense arid plains, and impassable with burthens, except by a creature possessing at once great strength and an extraordinary capacity of enduring privation,) the intercourse of mankind would have been confined to small spots where abundance reigned; the commodities of one part of that immense region could not have been exchanged for those of another; commerce, the great moving principle in the extension of civilization, would have been unknown; and knowledge would have been limited to particular districts, and would there have been of the most stunted and feeble growth—in the same way that a native crab-stock produces sour and worthless fruit, till some slip from the tree of another climate is grafted upon it. Thus, instead of the learning of the Hindoos and the Egyptians being communicated from one region to the other,* and thence, spreading over Greece, becoming the imperishable possession of the human race,—and instead of the produce of the East being brought to the West, to induce that taste for comforts and luxuries which principally develops the human intellect,—that portion of mankind which was first civilized would probably at this day have been in the same state of ignorance as the Indians of South America, whose communications are cut off by sandy deserts and inaccessible mountains, and who thus believe that the affairs of their mission (a settlement of a few hundred natives under a priest) comprise every thing that can be of interest to any individual of the great family of man.—See *Library of Entertaining Knowledge—Menageries*.

* See Frederic Schlegel's *History of Literature*.

be propagated in one of a different nature. Many vain efforts have been tried to propagate the camel in Spain; they have been transported into America, but have multiplied in neither. It is true, indeed, that they may be brought into these countries, and may, perhaps, be found to produce there; but the care of keeping them is so great, and the accidents to which they are exposed, from the changeableness of the climate, are so many, that they cannot answer the care of keeping. In a few years also they are seen to degenerate; their strength and their patience forsake them; and instead of making the riches, they become the burden of their keepers.

But it is very different in Arabia, and those countries where the camel is turned to useful purposes. It is there considered as a sacred animal, without whose help the natives could neither subsist, traffic, or travel; its milk makes a part of their nourishment; they feed upon its flesh, particularly when young; they clothe themselves with its hair, which it is seen to moult regularly once a-year; and if they fear an invading enemy their camels serve them in flight, and in a single day they are known to travel above a hundred miles. Thus, by means of the camel, an Arabian finds safety in his deserts; all the armies upon earth might be lost in the pursuit of a flying squadron of this country mounted upon their camels, and taking refuge in solitudes, where nothing interposes to stop their flight, or to force them to wait the invader. Nothing can be more dreary than the aspect of these sandy plains, that seem entirely forsaken of life and vegetation: wherever the eye turns, nothing is presented but a sterile and dusty soil, sometimes torn up by the winds, and moving in great waves along, which, when viewed from an eminence, resembles less the earth than the ocean; here and there a few shrubs appear, that only teach us to wish for the grove—that remind us of the shade in these sultry climates, without affording its refreshment: the return of morning, which, in other places, carries an idea of cheerfulness, here serves only to enlighten the endless and dreary waste, and to present the traveller with an unfinished prospect of his forlorn situation: yet in this chasm of nature, by the help of the camel, the Arabian finds safety and subsistence. There are here and there found spots of verdure, which, though remote from each other, are, in a manner, approximated by the labour and industry of the camel,

Thus these deserts, which present the stranger with nothing but subjects of danger and sterility, afford the inhabitant protection, food, and liberty. The Arabian lives independent and tranquil in the midst of his solitudes; and, instead of considering the vast solitudes spread round him as a restraint upon his happiness, he is, by experience, taught to regard them as the ramparts of his freedom.

The camel is easily instructed in the methods of taking up and supporting his burden; their legs, a few days after they are produced, are bent under their belly; they are in this manner loaded, and taught to rise; their burden is every day thus increased, by insensible degrees, till the animal is capable of supporting a weight adequate to its force; the same care is taken in making them patient of hunger and thirst: while other animals receive their food at stated times, the camel is restrained for days together, and these intervals of famine are increased in proportion as the animal seems capable of sustaining them. By this method of education they live five or six days without food or water; and their stomach is formed most admirably by nature to fit them for long abstinence; besides the four stomachs, which all animals have that chew the cud, (and the camel is of the number,) it has a fifth stomach, which serves as a reservoir, to hold a greater quantity of water than the animal has an immediate occasion for. It is of a sufficient capacity to contain a large quantity of water, where the fluid remains without corrupting, or without being adulterated by the other aliments; when the camel finds itself pressed with thirst, it has here an easy resource for quenching it; it throws up a quantity of this water, by a simple contraction of the muscles, into the other stomachs, and this serves to macerate its dry and simple food; in this manner, as it drinks but seldom, it takes in a large quantity at a time, and travellers, when straitened for water, have been often known to kill their camels for that which they expected to find within them.

In Turkey, Persia, Arabia, Barbary, and Egypt, their whole commerce is carried on by means of camels; and no carriage is more speedy, and none less expensive, in these countries. Merchants and travellers unite themselves into a body, furnished with camels, to secure themselves from the insults of the robbers that infest the countries in which they live. This assemblage

is called a *caravan*, in which the numbers are sometimes known to amount to above ten thousand, and the number of camels is often greater than those of the men: each of these animals is loaded according to his strength, and he is so sensible of it himself, that when his burden is too great, he remains still upon his belly, the posture in which he was laden, refusing to rise, till his burden be lessened or taken away. In general, the large camels are capable of carrying a thousand weight, and sometimes twelve hundred; the dromedary, from six to seven. In these trading journeys, they travel but slowly, their stages are generally regulated, and they seldom go above thirty, or at most about five and thirty miles a-day. Every evening, when they arrive at a stage, which is usually some spot of verdure, where water and shrubs are in plenty, they are permitted to feed at liberty; they are then seen to eat as much in an hour as will supply them for twenty-four; they seem to prefer the coarsest weeds to the softest pasture: the thistle, the nettle, the cassia, and other prickly vegetables, are their favourite food; but their drivers take care to supply them with a kind of paste composition, which serves as a more permanent nourishment. As these animals have often gone the same track, they are said to know their way precisely, and to pursue their passage when their guides are utterly astray; when they come within a few miles of their baiting-place, in the evening, they sagaciously scent it at a distance, and increasing their speed, are often seen to trot with vivacity to their stage.

The patience of this animal is most extraordinary; and it is probable that its sufferings are great; for when it is loaded it sends forth most lamentable cries, but never offers to resist the tyrant that oppresses it. At the slightest sign it bends its knees and lies upon its belly, suffering itself to be loaded in this position; by this practice, the burden is more easily laid upon it than if lifted up while standing; at another sign it rises with its load, and the driver getting upon its back between the panniers, which, like hampers, are placed upon each side, he encourages the camel to proceed with his voice and with a song. In this manner the creature proceeds contentedly forward with a slow uneasy walk, of about four miles an hour, and when it comes to its stage lies down to be unloaded as before.¹

¹ Mr Sonini says, he has sometimes seen them weary of the impatience of their riders, stop short, turn round their long necks to bite them, and utter

Mr Buffon seems to consider the camel to be the most domesticated of all other creatures, and to have more marks of the tyranny of man imprinted on its form. He is of opinion that this animal is not now to be found in a state of nature; that the humps on its back, the callosities upon its breast and its legs, and even the great reservoir for water, are all marks of long servitude and domestic constraint. The deformities he supposes to be perpetuated by generation; and what at first was accident at last becomes nature. However this be, the humps upon the back grow large in proportion as the animal is well fed, and if examined, they will be found composed of a substance not unlike the udder of a cow.

The inhabitants generally leave but one male to wait on ten females, the rest they castrate; and though they thus become weaker, they are more manageable and patient. The female receives the male in the same position as when these animals are loaded; she goes with young for about a year, and like all other great animals, produces but one at a time. The camel's milk is abundant and nourishing, and mixed with water makes a principal part of the beverage of the Arabians. These animals begin to engender at three years of age, and they ordinarily live from forty to fifty years. The genital part of the male resembles that of the bull, but it is placed pointing backwards, so that its urine seems to be ejected in the manner of the female. This, as well as the dung, and almost every part of this animal, is converted to some useful purpose by the keepers. Of the urine, sal ammoniac is made; of the dung, litter for the horses, and fire for the purpose of dressing their victuals. Thus, this animal alone seems to comprise within itself a variety of qualities, any one of which serves to render other quadrupeds absolutely necessary for the welfare of man: like the elephant it is manageable and tame; like the horse, it gives the rider security; it carries greater burdens than the ox or the mule, and its milk is furnished in as great abundance as that of the cow; the flesh of the young ones is supposed to be as delicate as veal; their hair is more beautiful, and more in request than wool; while even of its very excrements no part is useless.

cries of rage. In these circumstances the man must be careful not to alight, as he would infallibly be torn to pieces; he must also refrain from striking his beast, as that would but increase his fury.

CHAP. VII.

THE LLAMA.*

As almost all the quadrupeds of America are smaller than the resembling ones of the ancient continent, so the llama,

* The llamas form a secondary groupe of camels, offering to the eye of the naturalist very small anatomical differences of construction from that of the camel, properly so called. The foot of the llama is not like that of the camel, covered with an elastic sole which joins the two toes. From the absence of this entire sole, the species of South America is enabled to climb the precipices of the Andes which are its native region, the toes having strong nails, each of which has a thick cushion, or pad below. The llama also wants the second canine tooth in the lower jaw;—but this difference is not by some considered such as to require a separation of the genus—for deer, of various species, have the same deviation from the general type. Again, the absence of the hump in the llama species is not an anatomical difference which constitutes a character;—for as the skeleton of the Bactrian camel with two humps does not differ from that of the Arabian with one, so does the arrangement of the bones of the llama agree precisely with the conformation of the camel. The zebu is an ox although he has a hump. The ears of the llama are longer, and the tail shorter than those of the camel. The similarities which determine the genus to which the camels and the llamas belong are principally these;—1. Each species has very remarkable peculiarities connected with the economy of their reproduction in which they differ from all other animals. 2. The camel and the llama differ also from every other species of the class of ruminating animals in the want of horns, and in having two large incisive teeth, on each side of the upper jaw. 3. The stomachs of the camel and the llama are, in some degree similarly constructed. Father Feuillee has described the stomach of the llama; and maintains that it has not only a large reservoir for carrying water, but that, like the stomach of the camel, it has the same machinery for allowing the separation of solid from liquid aliment. Sir Everard Home, however, describes this portion of the llama's stomach as only partially resembling that of the camel. He says, "The stomach has a portion of it, as it were, intended to resemble the reservoirs for water in the camel; but these have no depth, are only superficial cells, and have no muscular apparatus to close their mouths, and allow the solid food to pass into the fourth cavity, or truly digesting stomach, without going into these cells." But that the llama has an internal mechanism for retaining water or secreting a liquid substance, is certain; for on the summits of the Andes they are far above any lakes; and it has been observed that in a state of domestication they never exhibit a desire to drink, whilst they can obtain green pasture. 4. The llama, according to Molina, (*Storia Nat. del Chili*) has a conformation resembling the camel's hump, being provided with an excess of nutritive matter, which lies in a thick bed of fat under the skin, and is absorbed as a compensation for an occasional want of food. These remarkable

which may be considered as the camel of the new world, is every way less than that of the old. This animal, like that described in the former chapter, stands high upon its legs, has a long neck, a small head, and resembles the camel, not only in

similarities certainly warrant naturalists in classing the camel and the llama in the same genus, although they differ both in size and form. They are each evidently fitted by nature for the endurance of great hardships and privations—the one amidst the sands of the desert, under a burning sun—the other on the wastes of some of the loftiest mountains of the world, with a region of perpetual snow above them. The slight variations in their conformation, such as that of the foot, are modifications of nature which fit them for their respective localities. A habitation amongst the rocks would be mechanically impossible for the camel; whilst the burning plains would be as little suited to the llama. But each is adapted to exist in a very arid and sterile region; and their habits are created by their peculiar organization.

In the gardens of the zoological Society, are two individuals of the llama family, the brown and the white llama.

The domestication of the llama, in his native regions, has doubtless had a considerable effect in producing those differences of colour for which the species is remarkable. These variations, and some other distinctions arising not only out of the length and fineness of the wool, but also from dissimilarities of form, have led to a considerable contrariety of opinion amongst naturalists, whether individuals of this family belong to different species, or are varieties of the same. The French naturalists seem generally to agree with Buffon, in dividing the gronpe into three species—the llama, the alpaca, and the vigogna;* but others adopting the description of Molina, add two other species—the guanaco and the hueco.

Llamas have been frequently brought to England within the last twenty years, and have been exhibited in the menageries. His majesty had several at Windsor, which were allowed to range in a paddock; but they did not long endure the climate. The individual described by Buffon as the *vigogna*, was more than a year in England, and lived for about the same time in France. It was remarkable that this animal never took any liquid whatever, but its secretion of saliva must have been considerable, for it spat upon all who approached it. The greatest number of llamas that were ever brought over to Europe, at one time, was a herd that arrived at Cadiz in 1808. It originally consisted of thirty-six individuals, including the sorts called llamas, alpacas, and vigonias. They were brought from Lima in Peru, and Concepcion in Chili, to Buenos Ayres, by slow journeys of two or three leagues. They were fed on the road with potatoes, maise, and hay, but when their supply of potatoes was exhausted, they became so constipated, that it was necessary to afford them medical relief. Eleven only of the number arrived at Cadiz, of which two died there. These animals were brought to Europe as a present from Godoy (the Prince of the Peace) to the Empress Josephine; but they arrived just at the period of his disgrace.

* This division by Buffon is found in the Supplement to his works. He had previously recognized only two species.

its natural mildness, but its aptitude for servitude, its moderation, and its patience. The Americans early found out its useful qualities, and availed themselves of its labours: like the camel, it serves to carry goods over places inaccessible to other beasts of burden; like that, it is obedient to its driver, and often dies under, but never resists, his cruelty.

Of these animals, some are white, others black, but they are mostly brown; its face resembles that of the camel, and its height is about equal to that of an ass. They are not found in

at the commencement of the Spanish revolution, and the populace, in hatred to their late minister, were about to throw the llamas into the sea. The governor of Cadiz, however, rescued them; and they were given in charge of an eminent Spaniard, Don Francisco de Therau, who had a fine zoological garden at San Lucar de Barrameda, in Andalusia. The French armies having subsequently traversed this province, Marshal Soult took the llamas under his care; and Monsieur Bory de Saint Vincent, a distinguished French naturalist who accompanied the army, studied their habits with great attention, and made some drawings of them, which were afterwards lost at the battle of Vittoria. He paid particular attention to the quality of their wool, and transmitted some specimens of each sort to the Academy of Sciences at Paris. It appears from the report of M. de Saint Vincent and Don Francisco de Therau, that the fleece of the alpa-vigonia (the cross between the vigonia and the alpaca) is much longer, and six times heavier than that of any other variety. From the opportunities which these naturalists had of observing the llamas, the fact was ascertained which has been stated by some travellers, that the individuals of every sort had the remarkable habit of depositing their dung in one particular spot. It is this habit which betrays the herds to the hunters in the South American mountains.

The llamas of South America furnish a beautiful example of the determination of the locality of a particular group of animals, according to the elevation of the surface, where they find their food. This selection is probably determined by the temperature. The llamas are stationed upon different stages of the Cordilleras; and are found, or disappear, throughout that enormous chain of mountains, as the summits are elevated or depressed. Thus they range considerably below the line of perpetual snow, from Chili to New Granada, without reaching the isthmus of Panama. The species is not found in Mexico; and this remarkable circumstance is to be ascribed to the fact that at the isthmus the Cordillera has a less elevation than is suited to their natures and wants. In the same way some of the Alpine animals of Europe, (such as the bouquetin,) which never descend into the plains, are found upon mountains at long intervals, although the line of their summits is interrupted. This locality is determined by elevation. The same fact is constantly observed with regard to plants.

The llama was found by the Spaniards at the period of their conquest of South America. It was the only beast of burthen which the natives possessed. Its flesh was eaten by the Indians:—and its wool was woven into cloth.

the ancient continent, but entirely belong to the new; nor are they found spread over all America, but are found chiefly upon those mountains that stretch from New Spain to the Straits of Magellan. They inhabit the highest regions of the globe, and seem to require purer air than animals of a lower situation are found to enjoy. Peru seems to be the place where they are found in greatest plenty. In Mexico they are introduced rather as curiosities than beasts of burden; but in Potosi, and other provinces of Peru, they make the chief riches of the Indians and Spaniards who rear them: their flesh is excellent food; their hair or rather wool, may be spun into beautiful clothing; and they are capable, in the most rugged and dangerous ways, of carrying burdens not exceeding a hundred weight, with the greatest safety. It is true, indeed, that they go but slowly, and seldom above fifteen miles a-day; their tread is heavy, but sure; they descend precipices, and find footing among the most craggy rocks, where even men can scarcely accompany them: they are, however, but feeble animals, and after four or five days labour they are obliged to repose for a day or two. They are chiefly used in carrying the riches of the mines of Potosi; and we are told that there are above three hundred thousand of these animals in actual employ.

This animal, as was said before, is above three feet high, and the neck is three feet long, the head is small and well proportioned, the eyes large, the nose long, the lips thick, the upper divided, and the lower a little depending; like all those animals that feed upon grass, it wants the upper cutting teeth; the ears are four inches long, and move with great agility; the tail is but five inches long, it is small, straight, and a little turned up at the end; it is cloven-footed like the ox, but it has a kind of spear-like appendage behind, which assists it in moving over precipices and rugged ways; the wool on the back is short, but long on the sides and the belly; it resembles the camel in the formation of the genital parts in the male, so that it makes urine backwards; it couples also in the same manner, and though it finds much difficulty in the action, it is said to be much inclined to venery. A whole day is often passed before this necessary business can be completed, which is spent in growling, quarrelling, and spitting at each-other; they seldom produce above one

at a time, and their age never extends above ten or twelve years at farthest.

Though the llama is no way comparable to the camel, either for size, strength, or perseverance, yet the Americans find a substitute in it, with which they seem perfectly contented. It appears formed for that indolent race of masters which it is obliged to serve; it requires no care, nor no expense in the attending or providing for its sustenance; it is supplied with a warm covering, and therefore does not require to be housed; satisfied with vegetables and grass, it wants neither corn nor hay to subsist it; it is not less moderate in what it drinks, and exceeds even the camel in temperance. Indeed, of all other creatures, it seems to require water least, as it is supplied by nature with saliva in such large quantities, that it spits it out on every occasion: this saliva seems to be the only offensive weapon that the harmless creature has to testify its resentment. When overloaded or fatigued, and driven on by all the torturing acts of its keeper, it falls on its belly, and pours out against him a quantity of this fluid; which, though probably no way hurtful, the Indians are much afraid of. They say, that wherever it falls, it is of such an acrimonious nature that it will either burn the skin, or cause very dangerous eruptions.*

Such are these animals in their domestic state; but as they are found wild in very great numbers, they exhibit marks of great force and agility in their state of nature. The stag is scarcely more swift, or the goat or the shamoy a better climber. All its shapes are more delicate and strong; its colour is tawny, and its wool is but short; in their native forests, they are gregarious animals, and are often seen in flocks of two or three hundred at a time. When they perceive a stranger, they regard him at first with astonishment, without marking any fear or surprise; but shortly, as if by common consent, they snuff up the air, somewhat like horses, and at once, by a common flight, take refuge on the tops of the mountains; they are fonder of the northern than the southern side of the Andes; they often climb above the snowy tracts of the mountain, and seem vigorous in proportion to the coldness of their situation. The natives hunt the wild llama for the sake of its fleece. If the dogs surprise one upon the plain, they are generally successful; but if once

* The saliva of llamas, it is now well ascertained, is perfectly harmless.

the llama obtains the rocky precipice of the mountain, the hunters are obliged to desist in their pursuit.

The llama seems to be the largest of the camel kind in America ; there are others, which are called GUANACOE and PACOE, that are smaller and weaker, but endued with the same nature, and formed pretty much in the same manner. They seem to bear the same proportions to each other, that the horse does to the ass, and are employed with the same degree of subordination. The wool, however, of the paco, seems to be the most valuable, and it is formed into stuffs not inferior to silk, either in price or beauty. The natural colour of the paco, is that of a dried rose leaf ; the manufacturers seldom give its wool any other dye, but form it into quilts and carpets, which exceed those from the Levant. This manufacture forms a very considerable branch of commerce in South America, and probably, too, might be extended to Europe, were the beauty and the durability of what is thus wrought up sufficiently known.

CHAP. VIII.

THE NYL-GHAU.*

THIS animal, the name of which is pronounced *nylgaw*, is a native of India, and has but lately been imported into Europe ;

* This quadruped is a species of antelope. The male nyl-ghau is superior in stature to the stag, as well as more robust in its proportions. His head is rather large ; his muzzle long and narrow ; his ears middle-sized, open, and terminating abruptly in an obtuse point ; his neck long and thick ; his shoulders surmounted by a slight hump ; his hinder quarters much less elevated than his fore parts ; his legs thicker than those of most other antelopes ; and his tail of considerable length, reaching below the joint of the leg, and ending in a tuft of long hairs. His eyes are full, black, and prominent ; and his suborbital sinuses large and obvious. The form of his horns is conical and slightly curved, with the concavity directed inwards and the points turned forwards. They take their origin by a triangular base of considerable thickness, marked with two or three indistinctly elevated rings, but become perfectly round and smooth above, tapering rapidly into a rather obtuse point. Their length is from seven to eight inches ; and their colour a uniform dull black, corresponding with that of the hoofs.

On all the upper parts of the body the general colour is of a slaty grey, the bases of the hairs being for the most part white with an occasional tinge of

it seems to be of a middle nature, between the cow and the deer, and carries the appearance of both in its form. In its size, it is as much smaller than the one, as it is larger than the other; its body, horns, and tail, are not unlike those of a bull; and the

brown, and their tips dusky black. A thin mane of long black and white hairs extends along the middle line of the neck and part of the back. The head, legs, and under parts of the body are of a much deeper shade than the upper, the general tint being grayish black with a slight mixture of brown. On the forehead a few darker lines pass obliquely above and between the eyes. The muzzle, lips, inside of the mouth, and tongue are dusky brown. Along the outer edges of the lips and on the fore part of the chin, the hairs are pure white; two roundish spots of white also occur on either side of the face behind the angle of the mouth, and a third, less distinctly marked, above the inner angle of the eye. A narrow band of white passes along the centre of the throat, and terminates on the upper part of the neck in a broad patch. The legs are also most commonly marked by a transverse white band immediately above the hoofs in front, and by a second patch of the same opposite to the accessory hoofs on the inner side. Beneath the fore part of the neck is a tuft of long pendulous black hairs; and those which terminate the tail are of the same colour. The under side of the latter, the long hairs by which it is fringed, and the adjacent parts, are nearly white.

The female is much smaller than the male, and at the same time lighter and more slender in her proportions. She is entirely destitute of horns, has a less hump on the shoulders, and her hind quarters are more nearly on a level with her fore. Her general colour, as also that of the young male, is a pale reddish brown, marked with precisely the same spots and patches of white as appear upon the full grown male.

The nyk-ghaus appear to be by no means generally spread over the peninsula of Hindostan, but to be confined to its north-western provinces and the countries situated between them and Persia. Bernier, who alone of all the older travellers mentions the animal by name, or in such a manner as to admit of its being recognised, introduces it incidentally as one of the beasts which were hunted by the Mogul Emperor Aurung-zebe during his progress from Delhi to his summer retreat in Cashmere. It would seem from the numbers of which he speaks as being sometimes taken on those occasions, to be very abundant; but we have not, up to the present time, any particular account of its habits in a state of nature. In captivity it is gentle and familiar, licking the hands of those who offer it bread, and suffering itself to be played with, not only without shyness, but with evident pleasure. There are, however, seasons in which it becomes capricious in its temper. When meditating an attack it falls suddenly upon its fore knees, shuffles onwards in that posture until it has advanced to within a few paces of the object of its irritation, and then darts forward with a powerful spring, and butts with its head in the most determined manner. Its walk is awkward in consequence of the comparative shortness of its hind legs, and the width to which it extends them; but in running this defect is scarcely perceptible. Lord Clive's original specimens several times produced young; but we are not aware that the breed has been continued, or that the same success has attended their introduction in other quarters.

head, neck, and legs, are very like those of a deer. The colour, in general, is ash or gray, from a mixture of black hairs and white ; all along the ridge or edge of the neck, the hair is blacker, larger, and more erect, making a short, thin, and upright mane. Its horns are seven inches long ; they are six inches round at the root ; growing smaller by degrees, they terminate in a blunt point. The bluntness of these, together with the form of its head and neck, might incline us to suppose it was of the deer kind ; but, as it never sheds its horns, it has a greater affinity to the cow.

From the disposition of that brought over to this country, which has been very accurately and minutely described by Dr Hunter, their manners are harmless and gentle. Although in its native wildness it is said to be fierce and vicious, this seemed pleased with every kind of familiarity, and always licked the hand that stroked or gave it bread, and never once attempted to use its horns offensively ; it seemed to have much dependence on its organs of smell, and snuffed keenly, and with noise, whenever any person came within sight ; it did so likewise when any food or drink was brought to it ; and was so easily offended with smells, or so cautious, that it would not taste the bread which was offered, when the hand happened to smell strong of turpentine. Its manner of fighting is very particular. It was observed at Lord Clive's, where two males were put into a little inclosure, that, while they were at a considerable distance from each other, they prepared for the attack, by falling upon their fore-knees, when they shuffled towards each other with a quick pace, keeping still upon their fore-knees ; and when they were come within some yards, they made a spring, and darted against each other. The intrepidity and force with which they dart against any object, appeared by the strength with which one of them attempted to overturn a poor labourer, who unthinkingly stood on the outside of the pales of its inclosure. The nylghau, with the quickness of lightning, darted against the wood-work with such violence, that he broke it to pieces, and broke off one of his horns close to the root, which occasioned the animal's death. At all the places in India, where we have settlements, they are considered as rarities, and brought from the distant interior parts of the country. The Emperor, sometimes, kills them in such numbers as to distribute quarters of them to

all his omrals ; which shows that they are internally wild and in plenty, and esteemed good and delicious food. The nyl-ghaus which have been brought to England, have been most, if not all of them, received from Surat or Bombay ; and they seem to be less uncommon in that part of India, than in Bengal ; which gives room for a conjecture, that they may be indigenous perhaps in the province of Guzarat, one of the most western and most considerable of the Hindostan empire, lying to the northward of Surat, and stretching away to the Indian ocean.

CHAP. IX.

THE BEAR.¹

OF the Bear there are three different kinds, the Brown Bear of the Alps, the Black Bear of North America, which is smaller, and the great Greenland or White Bear. These, though different in their forms, are no doubt of the same original, and owe their chief variations to food and climate. They have all the same habitudes, being equally carnivorous, treacherous, and cruel. It has been said, indeed, that the black bear of America rejects animal food ; but of the contrary I am certain, as I have often seen the young ones, which are brought over to London, prefer flesh to every kind of vegetable aliment.

The BROWN BEAR is properly an inhabitant of the temperate climates ; the black finds subsistence in the northern regions of Europe and America ; while the great white bear takes refuge in the most icy climates, and lives where scarcely any other animal can find subsistence.

The brown bear² is not only savage, but solitary ; he takes refuge in the most unfrequented parts, and the most dangerous

¹ The animals of this kind, including the Raccoon, Wolverine, Glutton, (See p. 286 of this volume) and Badger, have six front teeth in each jaw ; the two lateral ones of the lower jaw are longer than the rest, and lobed, and are likewise furnished with smaller or secondary teeth at their internal bases : the canine teeth are single ; there are five or six grinders on each side : the first of which is placed close to the canine teeth : the tongue is smooth : the snout projecting ; and the eyes furnished with a nictitant or winking membrane. The soles of the feet are long, and extend to the heel ; some use their fore paws as hands, and they are all able, except the Grizzly Bear, to climb trees in search of prey, or to avoid an enemy.

² Buffon.

2 x 2

precipices of unhabited mountains. It chooses its den in the most gloomy parts of the forest, in some cavern that has been hollowed by time, or in the hollow of some old enormous tree. There it retires alone, and passes some months of the winter without provisions, or without ever stirring abroad. However, this animal is not entirely deprived of sensation, like the bat or the dormouse, but seems rather to subsist upon the exuberance of its former flesh, and only feels the calls of appetite, when the fat it had acquired in summer begins to be entirely wasted away. In this manner, when the bear retires to its den, to hide for the winter, it is extremely fat; but at the end of forty or fifty days, when it comes forth to seek for fresh nourishment, it seems to have slept all its flesh away. It is a common report, that during this time they live by sucking their paws, which is a vulgar error that scarcely requires confutation. These solitary animals couple in autumn, but the time of gestation with the female is still unknown: * the female takes great care to provide a proper retreat for her young; she secures them in the hollow of a rock, and provides a bed of hay in the warmest part of her den; she brings forth in winter, and the young ones begin to follow her in spring. The male and female by no means inhabit the same den; they have each their separate retreat, and seldom are seen together but upon the accesses of genial desire.†

* The bear is gravid 112 days.

† The Black Bear of America is distinguished from his fellows, and more especially from the brown bear of Europe, which he approaches most nearly in size and form, by few very striking external differences, except the colour of his fur. His forehead has a slight elevation; his muzzle is elongated, and somewhat flattened above; and his hair, though long and straight, has less shagginess than that of most of the other species of the group. In colour it is of a uniform shining jet black, except on the muzzle, where it is short and fawn-coloured, becoming almost gray on the lips and sides of the mouth. This, however, it should be observed, is the character only of the full-grown animal: the young are first of a bright ash colour, which gradually changes to a deep brown, and finally fixes in the glossy black tint of mature age.

The habits and manners of the Black Bear resemble those of the brown almost as closely as his physical characters. In a state of nature he seeks the recesses of the forest, and passes his solitary life in wild and uncultivated deserts, far from the society of man, and avoiding even that of the animal creation. His usual food consists of the young shoots of vegetables, of their roots, which he digs up with his strong and arcuated claws, and of their fruits, which he obtains by means of the facility with which the same organs enable him to climb the loftiest trees. He possesses indeed the faculty of climbing in a most extraordinary degree, and frequently exercises it in the

The voice of the bear is a kind of growl, interrupted with rage, which is often capriciously exerted ; and though this animal seems gentle and placid to its master, when tamed, yet it is still to be distrusted and managed with caution, as it is often treacherous and resentful without a cause.

pursuit of honey, of which he is passionately fond. When all these resources fail him, he will attack the smaller quadrupeds, and sometimes even animals of considerable size ; familiarity with danger diminishing his natural timidity, and the use of flesh begetting a taste for its continued enjoyment. He is also said, like the Polar Bear, to have a peculiar fondness for fish, and is frequently met with on the borders of lakes and on the coast of the sea, to which he has resorted for the gratification of this appetite. Notwithstanding his apparent clumsiness, he swims with the greatest dexterity, the excessive quantity of fat with which he is loaded serving to buoy him up in the water ; in this way he frequently crosses the broadest rivers, or even very considerable arms of the sea.

The entire continent of North America, or perhaps it might be more correct to say, that immense portion of its surface which still remains uncultivated and desolate, furnishes an abode to this species of bear, which is consequently as widely dispersed as any of his tribe. As his fur is of some value in commerce, although not so much sought after at the present day as it was formerly, his race has become an object of the cupidity of man, by whom they are frequently hunted for the sake of their skins. This chase is principally followed by the Indians, who are also attracted by the flavour of his flesh, of which, and especially of the fat, they partake with an avidity truly disgusting. Travellers, however, who have been reduced to the necessity of having recourse to this sort of food, speak of it as by no means despicable ; the fat yields moreover a quantity of oil, which is often extremely serviceable. The Indians will sometimes attack these animals single-handed ; and if they can manage to keep beyond the reach of their powerful grasp, which is almost irresistible, are sure of gaining the victory ; as the bears, in the rampant posture which they always assume in self-defence, unconsciously expose their most vulnerable parts to the attack of the hunter. Snares are sometimes laid for them ; but these are most frequently unsuccessful ; that extreme caution, which is so strongly portrayed in their actions and demeanor, rendering them mistrustful of every thing. Nevertheless their gluttony will sometimes get the better of their prudence, and the bait of honey offers too tempting an allurements to be always resisted. At other times a whole tribe of Indians will assemble for the chase, and after having performed a variety of superstitious observances, beat the entire country for their game, drive a great number of them into a spot selected for the purpose, and deal forth upon them wholesale destruction. They will also trace them to their retreats in the season of their lethargy, which occupies several of the winter months, and during which the bears are incapable of offering any effectual resistance.

In captivity the Black Bear is distinguished from the brown only by the less degree of docility and intelligence which he evinces : and the habits of the latter are so universally known that it would be useless to dwell upon them here.

This animal is capable of some degree of instruction. There are few but have seen it dance in awkward measures upon its hind feet, to the voice or the instrument of its leader; and it must be confessed that the dancer is often found to be the best

The Grizzly Bear. A native also of the northern division of America, and more particularly of that extensive tract of country which constitutes the newly erected State of Missouri, the Grizzly Bear differs in many striking points, both of character and habits, from the Black Bear, as well as from every other animal of the very natural group of which he forms part. By his elongated, narrowed, and flattened muzzle, added to the slight elevation of his forehead, he is closely connected with the black bear of America, and as remarkably distinguished from the common brown bear of Europe, and from the white bear of the polar regions, which last, in size and general form, offers perhaps the nearest approximation to the present species. But his enormous magnitude, which may be stated as averaging twice the bulk of the black bear; the greatly increased size and power of his canine teeth: and, above all, the excessive length of his talons, on the fore feet especially, afford characteristic differences so obvious and so essential, that it is difficult to conceive how they could have been so long overlooked by naturalists as well as travellers, who have all, until within little more than twenty years of the present time, passed him over without even a casual hint that he presented any claims to be considered as distinct from the common species of his country.

His hair, generally speaking, is longer, finer, and more abundant than that of the black bear, and varies in colour to an almost indefinite extent, passing through all the intermediate shades between a light gray and a black brown. The brown tinge is, however, the most common; and it is always more or less grizzled either by the intermixture of grayish hairs, or by the brown hairs being tipped with gray. The hair of the legs and feet is darker and coarser, and diminishes in length as it descends; on the muzzle it becomes remarkably pale, and is so much shortened as to give to the animal an appearance of baldness. His eyes are very small, and hardly at all prominent; and the line of the profile is consequently nearly straight. His tail is scarcely visible, being almost entirely concealed by the long hairs which surround it. Of the great size of his feet and talons, some judgment may be formed from the measurements given by Captains Lewis and Clarke, the first travellers by whom the grizzly bear was accurately described. These gentlemen inform us that the breadth of the fore foot in one of the individuals observed by them exceeded nine inches, while the length of his hind foot, exclusive of the talons, was eleven inches and three quarters, and its breadth seven inches. The claws of the fore foot of another specimen measured more than six inches. The latter are considerably longer and less curved than those of the hind feet, and do not narrow in a lateral direction as they approach their extremity, but diminish only from beneath: the point is consequently formed by the shelving of the inferior surface alone, their breadth remaining the same throughout the whole of their enormous length, and their power being proportionally increased; an admirable provision for enabling the animal to exercise to the fullest extent his propensity for digging up the ground, either in search of food or for other purposes. It appears, however, on the other hand, to unfit him for climbing trees, which he never attempts; and

performer of the two. I am told that it is first taught to perform in this manner, by setting it upon hot plates of iron, and then playing to it, while in this uneasy situation.

The bear, when come to maturity, can never be tamed ; it

this remarkable circumstance in his habits affords a striking distinction between him and all the other bears, which are essentially climbers.

Of all the quadrupeds which inhabit the northern regions of the American continent, the grizzly bear is unquestionably the most formidable and the most dreaded. Superior to the rest of his tribe, not excepting even the polar species, in bulk, in power, in agility, and in the ferocity of his disposition, it is not to be wondered at that he should be regarded by the native Indians with an almost superstitious terror, and that some portion of this feeling should have been communicated even to the civilized travellers, who have occasionally met with him in the wild and desolate regions which are subject to his devastations. In the journals of some of these travellers we find recorded such astonishing instances of his strength, ferocity, and extraordinary tenacity of life as would indeed amaze us, were we not aware how much the human mind is prone, under certain circumstances, to fall into exaggeration, in many cases most certainly unintentional. Making however, all due allowances for the existence of this very natural feeling, we are bound to acknowledge that there are few animals who can compete with this terrible beast ; and that to be made the object of his pursuit is an occurrence well calculated to alarm the stoutest heart, even when provided with the most certain and deadly weapons of human invention, guided by the most experienced eye, and directed by the steadiest hand.

M. Duvaucel enumerates three species of bears inhabiting India and the neighbouring islands. The first of these is the *Ursus Labiatus*, which was strangely mistaken on its first arrival in Europe, nearly forty years ago, for a sloth, and received from the naturalists of that day the name of *Bradypus pentadactylus*, or *ursinus*, the Five-fingered, or *Ursine*, Sloth ; an appellation which has been productive of no little confusion in nomenclature, and is still frequently employed in menageries and exhibitions to distinguish the same animal, and sometimes even nearly related species. With the true sloths it has nothing in common ; and the only circumstance which can at all account for the blunder, consists in the accidental deficiency of the incisor teeth in the animal first examined ; a deficiency, which, according to the strict principles of the artificial system then adopted, was alone sufficient to convert a bear into a sloth. The second is the *Ursus Malayanus*, the Malay Bear, admirably illustrated, both with regard to character and habits, by the late lamented Sir Stamford Raffles in the thirteenth volume of the *Linnean Transactions*. The third is the Tibet Bear, which, according to his observations made on the living animal, is distinguished by the following characteristics. In size it is intermediate between the two other species which he describes. Its most remarkable distinction is derived from the thickness of its neck and the flatness of its head, its forehead forming almost a straight line with its muzzle. The latter is moderately thick and somewhat lengthened ; and the ears are very large. The body is compact, and the limbs heavy ; a conformation from which we might be led to infer great muscular strength, together with a capacity for climbing trees and performing other feats of a similar description, were it not for the compar-

then continues in its native fierceness, and though caged, still formidably impotent, at the approach of its keeper flies to meet him. But notwithstanding the fierceness of this animal, the natives of those countries where it is found, hunt it with great perseverance and alacrity. The least dangerous method of taking it is by intoxicating it, by throwing brandy upon honey, which it seems to be chiefly fond of, and seeks for in the hollow of trees. In Canada, where the BLACK BEARS are very common, and where their dens are made in trees that are hollow towards the top, they are taken by setting fire to their retreats, which are often above thirty-feet from the ground. The old one is generally seen first to issue from her den, and is shot by the hunters. The young ones as they descend are caught in a noose, and are either kept, or killed for provision. Their paws are said to be a great delicacy, and their hams are well enough known at the tables of the luxurious here. Their fat also, which still preserves a certain degree of fluidity, is supposed to be an efficacious remedy

active weakness of the claws, which are scarcely more than half as long as those of the other Indian bears. Like the latter, its colour is invariably of a uniform glossy jet-black, except on the lower lip, which is white; as is also a patch occupying the front of the neck, and in shape like a Y, the two upper limbs of which pass in front of the shoulders, while the lower one occupies the middle line of the chest. The upper part of the muzzle is black, with a slight reddish tint on the sides; and the edges of the lips flesh-coloured. The hair, which is smooth on the muzzle, becomes shaggy on the back part of the head, from the base of the ears downwards, and adds considerably to the apparent volume of that part, but not quite to the same extent as in the *Ursus labiatus*, in old individuals of which it almost touches the ground.

Another species connected with the above is the Bornean Bear. The Bornean bear is perhaps somewhat shorter in his proportions than the rest of the group, and the great proportional breadth of his head extends also to the neck and body. The claws are very long, strongly arched, and very gradually attenuated to the point, which is transversely truncated and chiefly fitted for digging the earth; but probably also for enabling it to climb with great agility. The fur is short and glistening, somewhat rigid, but closely applied to the skin, and smooth to the touch. On the body, head, and extremities, the Bornean bear has the same pure, saturated jet-black tint which is observed in the Malayan. The muzzle, including the region of the eyes, has a yellowish brown colour; and the anterior part of the neck is marked by a large broad patch of a more vivid and nearly orange tint, which is of an irregular quadrangular form, and deeply notched above. The difference in the form and colour of this patch constitutes the chief distinction between the present animal and Malayan species, in which latter it is crescent-shaped and white.

in white or indolent tumors, though probably very little superior to hog's lard.

THE WHITE GREENLAND BEAR differs greatly, both in figure and dimensions, from those already described; and though it preserves in general the external form of its more southern kindred, yet it grows to above three times the size. The brown bear is seldom above six feet long; the white bear is often known from twelve to thirteen. The brown bear is made rather strong and sturdy like the mastiff; the Greenland bear, though covered with very long hair, and apparently bulky, is nevertheless more slender, both as to the head, neck, and body, and more inclining to the shape of the greyhound. In short all the variations of its figure, and its colour seem to proceed from the coldness of the climate where it resides, and the nature of the food it is supplied with.

The white bear seems the only animal, that, by being placed in the coldest climate, grows larger than those that live in the temperate zones. All other species of animated nature diminish as they approach the poles, and seem contracted in their size by the rigours of the ambient atmosphere; but the bear, being unmolested in these desolate climates, and meeting no animal but what he can easily conquer, finding also a sufficient supply of fishy provisions, grows to an enormous size; and as the lion is the tyrant of an African forest, so the bear remains undisputed master of the icy mountains in Spitzbergen and Greenland. When our mariners land upon those shores, in such parts as have not been frequented before, the white bears come down to view them with an awkward curiosity; they approach slowly, seeming undetermined whether to advance or retreat, and being naturally a timorous animal, they are only urged on by the conscious experience of their former victories; however, when they are shot at, or wounded, they endeavour to fly, or, finding that impracticable, they make a fierce and desperate resistance till they die. As they live upon fish and seals, their flesh is too strong for food, and the captors have nothing but the skin to reward them for the dangers incurred in the engagement.

The number of these animals that are found about the north pole, if we consider the scarcity there of all other terrestrial creatures, is very amazing. They are not only seen at land, but

often on ice-floats, several leagues at sea. They are often transported in this manner to the very shores of Iceland, where they no sooner land, but all the natives are in arms to receive them. It often happens, that when a Greenlander and his wife are paddling out at sea, by coming too near an ice-float, a white bear unexpectedly jumps into their boat, and if he does not overset it, sits calmly where he first came down, and, like a passenger, suffers himself to be rowed along. It is probable the poor little Greenlander is not very fond of his new guest; however, he makes a virtue of necessity, and hospitably rows him to shore.

As this animal lives chiefly upon fish, seals, and dead whales, it seldom removes far from the shore. When forced by hunger, it often ventures into the deep, swims after seals, and devours whatever it can seize; it is, however, but a bad swimmer, and is often hunted in this manner by boats till it is fatigued, and at last destroyed. It often happens that a battle ensues between a bear and a morse or a whale; but as the latter are more expert in their own element, they generally prove victorious. However, when the bear can find a young whale, it repays him for the danger he incurs of meeting with the parent.

CHAP. X.

THE BADGER.

THE Badger's legs are so short that its belly seems to touch the ground; this, however, is but a deceitful appearance, as it is caused by the length of the hair, which is very long all over the body, and makes it seem much more bulky than it really is. It is a solitary stupid animal, that finds refuge remote from man, and digs itself a deep hole with great assiduity. It seems to avoid the light, and seldom quits its retreat by day, only stealing out at night to find subsistence. It burrows in the ground very easily, its legs being short and strong, and its claws stiff and horny. As it continues to bury itself, it throws the earth behind it to a great distance, and thus forms to itself a winding hole, at the bottom of which it remains in safety. As the fox is not so expert at digging into the earth, it often takes posses-

sion of that which has been quitted by the badger ; and, some say, forces it from its retreat, by laying its excrement at the mouth of the badger's hole.

This animal, however, is not long in making itself a new habitation, from which it seldom ventures far, as it flies but slowly, and can find safety only in the strength of its retreat. When it is surprised by the dogs at some distance from its hole, it then combats with desperate resolution ; it falls upon its back, defends itself on every side, and seldom dies unrevengeed in the midst of its enemies.

The badger, like the fox, is a carnivorous animal, and nothing that has life can come amiss to it.* It sleeps the greatest part of its time, and thus, without being a voracious feeder, it still keeps fat, particularly in winter. They always keep their hole very clean ; and when the female brings forth, she makes a comfortable warm bed of hay, at the bottom of her hole, for the reception of her young. She brings forth in summer, generally to the number of three or four, which she feeds at first with her milk, and afterwards with such petty prey as she can surprise. She seizes the young rabbits in their warren, robs birds' nests, finds out where the wild bees have laid up their honey, and brings all to her expecting brood.

The young ones when taken are easily tamed, but the old still continue savage and incorrigible ; the former, after a short time, play with the dogs, follow their master about the house, but seem of all other animals the most fond of the fire. They often approach it so closely, that they burn themselves in a dangerous manner. They are sometimes also subject to the mange ; and have a gland under their tail which scents pretty strongly. The poor of some countries eat their flesh ; which though fat is at best but rank and ill-tasted.†

* The badger's principal food is roots, fruits, snails, and worms. It seems quite a mistake, their living on animal food.

† The spotted badger is of a white colour, marked with reddish, yellow, and dusky spots. It inhabits Europe and the north of Asia, as far as the northern provinces of Persia and China, and in Japan. The white badger is said by Mr Brisson to have been brought from New York ; it has very small eyes, and very short legs, and is only one foot nine inches long, with a tail of nine inches. This variety or species, is supposed by Mr Bewick to be the same animal with the land bear. The spotted variety is very rare, nor is it mentioned from what country it was brought.

The American badger inhabits Labradore, and the country about Hud-

CHAP. XI.

THE TAPIR.

THERE seems to be a rude, but an inferior resemblance between many animals of the old and the new world. The cougar of America resembles the tiger in natural ferocity, though far inferior in its dimensions. The llama bears some affinity to the camel, but is far behind it in strength and utility. The tapir may be considered as the hippopotamus of the new continent, but degraded both as to its size and ferocity.

This animal bears some distant resemblance in its form to a mule. It has a long snout which it lengthens or contracts at pleasure. Its ears are small, long, and pendant. Its neck and tail are short, and its claws strong and firm, of which it has four upon each foot. Its skin is thick, and covered with brown hair; and the natives make shields of it, which cannot be pierced by an arrow.

This animal may, in some measure, be termed amphibious, as it chiefly resides in the water. It differs, however, from all others of this kind, in feeding entirely upon vegetables, and not making this element the place of its depredations. It feeds upon the pastures by the river-side, and, as it is very timorous, the instant it hears the least noise, it plunges into the stream. They are greatly sought after by the natives, as their flesh is

son's Bay, in North America. This animal has a strong resemblance to the common or European badgers, but is somewhat smaller, and the hair is longer, more soft and silky; the ears are short, and of a white colour, edged with black; the head is white, with a black line on each side running from the forehead close to the inner corner of the eye, down to the nose; the hair on the back is four or five inches long, bright brown for the under half, then bright yellow, above that black, and white at the tips: the legs are short, and of a dark brown colour; having five claws behind, and only four before, which are considerably longer and larger; but the want of the fifth claw on the fore part, being described from a dried specimen, may have been owing to accident. Its tail is covered with long dirty yellow hairs, tipped with white, having the ends dusky; the throat, breast, and belly are white; the fore feet have only four toes. It is uncertain whether this animal possesses the orifice under the tail. In each jaw there are six fore teeth, one tusk on each side of each, and four grinders on each side in both; in all thirty-two.

considered as a delicacy, and thought by some not inferior to beef.*

* The tapir has ten fore teeth in each jaw, and no tusks; the canine teeth are single in each jaw, and are bent inwards; there are five very broad grinders on each side in both jaws, with a vacancy between them and the cutting teeth. The fore feet have each four hoofs, and the hind feet three; but on the fore feet is an additional false or supplementary hoof. It has a long extensible and flexible proboscis or snout.

The tapir inhabits the woods and rivers of the eastern coast of South America, from the isthmus of Darien to the river Amazon. The tapir sleeps during the day in the thickest and most covert places of the woods, adjacent to the banks of rivers and lakes, into which it plunges when disturbed, and swims or wads on the bottom in the same manner with the hippopotamus. It goes about during the night in quest of food, and feeds on grass, sugar-canes, fruits, and other vegetables. It is an animal of mild and gentle nature, and is very easily made tame, being sometimes kept in farm-yards in Guinea, and fed along with the cattle; it is timorous, voracious, sluggish, and slowfooted, but swims remarkably well, and dives to the bottom of the water, where it walks as well as on dry land. When domesticated it becomes familiar; will take any thing that is offered, and will even rummage with its nose in people's pockets for meat. This is the largest of the animals that are peculiar to America, being about the size of a small cow and having some general resemblance to a hog; in the male the nose is elongated into a sort of proboscis or flexible trunk, which extends far below the lower jaw, and is capable of being contracted and extended at pleasure. The sides of the snout are furrowed lengthways, and with this the animal is able to lay hold of any thing, and convey it to its mouth; the nose of the female is destitute of this elongation, and both jaws are of equal length, ending in a pointed snout. The ears are roundish and erect; the eyes are very small; the neck is thick, short, and has a kind of bristly mane, about an inch and a half long on its upper part, near the head; the body is thick and clumsy, and the back is somewhat arched; the legs are short and thick, with small black hollow hoofs; the tail is very short and naked; the skin is very tough, and is covered with a short dusky coloured fur, which in young animals is spotted with white. The voice of this animal resembles a kind of hiss, or whistle, which is so easily imitated that in this manner it is frequently trepanned.

The general attitude of the tapir, when at rest, is sitting on its rump. It sleeps much by day, and when attacked by dogs, makes a vigorous resistance. It produces but one young at a birth, of which it is very careful, leading it early to the water, to instruct it in swimming. It is gregarious, feeds by night on vegetables, and does not ruminate, as M. Bajou affirms.

Of this genus there is only one species, which is entirely confined to South America, and therefore was unknown to the ancients.

A female tapir was exhibited at several of the fairs of Holland and Germany, the keepers usually feeding it on rye-bread, a kind of gruel, and vegetables of different kinds. It was excessively fond of apples, and was able to smell them at a considerable distance. If any persons happened to have apples in their pockets, it would eagerly approach them, and thrusting in its proboscis would take them out with surprising facility. It ate of almost

CHAP. XII.

THE RACCOON.

THE Raccoon, which some authors have called the Jamaica rat, is about the size of a small badger ; its body is short and bulky , its fur is fine, long, and thick, blackish at the surface, and gray towards the bottom ; the nose is rather shorter and more pointed than that of the fox ; the eyes large and yellow ; the teeth resembling those of a dog : the tail thick, but tapering towards a point regularly marked with rings of black, and at least as long as the body ; the fore-feet are much shorter than the hinder, both armed with five sharp claws, with which, and his teeth, the animal makes a vigorous resistance. Like the squirrel, it makes use of its paws to hold its food while eating, but it differs from the monkey kind, which uses but one hand on those occasions, whereas the racoon and the squirrel use both ; as wanting the thumb, their paws singly are unfit for grasping or holding. Though this animal be short and bulky, it is however very active ; its pointed claws enable it to climb trees with great facility ; it runs on the trunk with the same swiftness that it moves upon the plain, and sports among the most extreme branches with great agility, security, and ease ; it moves forward chiefly by bounding, and though it proceeds in an oblique direction, it has speed enough most frequently to escape its pursuers.

This animal is a native of the southern parts of America, nor have any travellers mentioned its being found in the ancient continent. But in the climates of which it is a native, it is found in noxious abundance, particularly in Jamaica, where it keeps in the mountains, and where it often descends to feed upon the plantations of sugar-cane. The planters of these climates consider these animals as one of their greatest miseries ; they have contrived various methods of destroying them, yet still they propagate in such numbers that neither traps nor fire-arms can set them free ; so that a swarm of these famished creatures are found

every thing that could be presented to it, whether vegetables, fish, or meat. Its favourite attitude was sitting on its rump like a dog ; and it never exerted its voice unless it was either fatigued or irritated

to do more injury in a single night than the labours of a month can repair.

But though, when wild, they are thus troublesome, in a state of tameness no animal is more harmless or amusing; they are capable of being instructed in various little amusing tricks. The racoon is playful and cleanly, and is very easily supported; it eats of every thing that is given it, and, if left to itself, no cat can be a better provider; it examines every corner, eats of all flesh, either boiled or raw, eggs, fruits, or corn; insects themselves cannot escape it, and, if left at liberty in a garden, it will feed upon snails, worms, and beetles; but it has a particular fondness for sweets of every kind, and to be possessed of these in its wild state, it incurs every danger. Though it will eat its provisions dry, it will for choice dip them in water, if it happens to be in the way. It has one peculiarity which few others have been found to possess—it drinks as well by lapping like a dog as by sucking like the horse.

CHAP. XIII.

THE COATIMONDI.*

THE first peculiarity with which this animal strikes the spectator is the extreme length of its snout, which, in some measure, resembles that of the hog, but elongated to a surprising degree; it bears some distant resemblance to the animal last described, except that the neck and the body are longer, the fur shorter, and the eyes smaller; but its principal distinction, as was said before, consists in the shape of its nose; the upper jaw being an inch longer than the lower, and the snout, which is moveable in every direction, turning up at the end. Like the racoon, it sits upon the hinder legs with great ease, and, in this position, with both paws carries the food to its mouth.

This animal is very subject to eat its own tail, which is rather longer than its body: but this strange appetite is not peculiar to the coati alone; the mococo, and some of the monkey kinds, do

* The coatimondi is one of the weasel tribe, and is now known by the name of the Brazilian weasel.

the same, and seem to feel no pain in wounding a part of the body so remote from the centre of circulation.

It seems possessed of the same playful qualities, and indiscriminate appetites, with the animal described in the last chapter; if left at liberty in a state of tameness, it will pursue the poultry, and destroy every living thing that it has strength to conquer; though it is playful with its keeper, yet it seems obstinately bent against receiving any instruction, and neither threats nor caresses can induce it to practise any arts to which it is not naturally inclined. When it sleeps, it rolls itself up in a lump, and in that position often continues for fourteen or fifteen hours together.

CHAP. XIV.

THE ANT-BEAR.

THERE are many animals that live upon ants in Africa and America; the pangolin or scaly lizard of Guinea may be considered among this number; but there are a greater variety in America, which make those minute insects their only subsistence. Though they are of different figures and sizes, yet, in general, they go under one common name of the ant-bear; the peculiar length and slenderness of their snout, their singular appetites, and the manner of taking their prey, striking us too strongly to attend to the minute differences of their size or form.

They have been classed by Mr Buffon into the LARGER TAMANDUA, the SMALLER TAMANDUA, and the ANT-EATER. The longest of this kind is four feet long, from the tip of the snout to the insertion of the tail; their legs are short, and armed with four strong claws; their tail is long and tufted, and the animal often throws it on its back like the squirrel. The second of this kind is not above eighteen inches long, the tail is without hair, and it sweeps the ground as the animal moves. The ANT-EATER, which is the third variety, is still smaller than either of the former, as it is not above seven inches from the tip of the snout to the insertion of the tail. The two former are of a

brown dusky colour, but this of a beautiful reddish, mixed with yellow. Though they differ in figure, they all resemble each other in one peculiarity, which is the extreme slenderness of their snout, and the amazing length of their tongue.

The snout is produced in so disproportionate a manner, that the length of it makes near a fourth part of the whole figure. A horse has one of the longest heads of any animal we know, and yet the ant-bear has one above twice as long, in proportion to its body. The snout of this animal is almost round and cylindrical ; it is extremely slender, and is scarcely thicker near the eyes than at its extremity. The mouth is very small, the nostrils are very close to each other, the eyes are little in proportion to the length of the nose, the neck is short, the tongue is extremely long, slender, and flattened on both sides ; this it keeps generally doubled up in the mouth, and is the only instrument by which it finds subsistence ; for the whole of this tribe are entirely without teeth, and find safety only in the remoteness and security of their retreat.

If we examine through the various regions of the earth, we shall find that all the most active, sprightly, and useful quadrupeds have been gathered round man, and either served his pleasures, or still maintained their independence by their vigilance, their cunning, or their industry. It is in the remote solitudes that we are to look for the helpless, the deformed, and the monstrous births of nature. These wretched animals, being incapable of defending themselves either by their agility or their natural arms, falls a prey to every creature that attacks them : they, therefore, retire for safety into the darkest forests, or the more desert mountains, where none of the bolder or swifter animals choose to reside.

It may well be supposed that an animal so helpless as the ant-bear is, with legs too short to fit it for flight, and unprovided with teeth to give it a power of resistance, is neither numerous, nor often seen ; its retreats are in the most barren and uncultivated parts of South America. It is a native only of the new continent, and entirely unknown to the old. It lives chiefly in the woods, and hides himself under the fallen leaves. It seldom ventures from its retreat, and the industry of an hour supplies it with sufficient food for several days together. Its manner of procuring its prey is one of the most singular in all natural his-

tory : as its name implies, it lives entirely upon ants and insects ; these, in the countries where it is bred, are found in the greatest abundance, and often build themselves hills five or six feet high, where they live in community. When this animal approaches an ant-hill, it creeps slowly forward on its belly, taking every precaution to keep itself concealed till it comes within a proper distance of the place where it intends to make its banquet ; there, lying closely along at its length, it thrusts forth its round red tongue, which is often two feet long, across the path of these busy insects, and there lets it lie motionless for several minutes together. The ants of that country, some of which are half an inch long, considering it as a piece of flesh accidentally thrown before them, come forth and swarm upon it in great numbers : but wherever they touch they stick ; for this instrument is covered with a slimy fluid, which, like bird-lime, entangles every creature that lights upon it. When, therefore, the ant-bear has found a sufficient number for one morsel, it instantly draws in the tongue, and devours them all in a moment ; after which it still continues in its position, practising the same arts until its hunger is entirely appeased ; it then retires to its hiding place once more, where it continues in indolent existence till again excited by the calls of hunger.

Such is the luxurious life of a creature that seems, of all others, the most helpless and deformed. It finds safety in its hiding-places from its enemies, and an ample supply in some neighbouring ant-hill for all its appetites. As it only tries to avoid its pursuers it is seldom discovered by them ; yet helpless as this animal is, when driven to an extremity, though without teeth, it will fight with its claws with great obstinacy. With these arms alone it has often been found to oppose the dog, and even the jaguar. It throws itself upon its back, fastens upon its enemy with all its claws, sticks with great strength and perseverance, and even after killing its invader, which is sometimes the case, does not quit its hold, but remains fastened upon it with vindictive desperation.¹

¹ Besides the animal here described, there are others of the same kind ; the most remarkable of which are, the little Ant-eater, or Fourmiller, and the prickly Ant-eater of New Holland. The former is singular for its having only two toes on the fore feet, armed with strong claws ; and a tail which it is able to coil round the branches of trees, and hold fast by. The

CHAP. XV.

THE SLOTH.

OF the Sloth there are two different kinds, distinguished from each other by their claws; the one, which in its native country is called the *unan*, having only two claws upon the fore feet, and being without a tail; the other, which is called the *ai*, having a tail, and three claws upon each foot. The *unan* has the snout longer, the ears more apparent, and the fur very different from the other. It differs also in the number of its ribs, this having forty-six, while the *ai* has but twenty-eight. These differences, however, which, though very apparent, have been but little regarded in the description of two animals which so strongly resemble each other in the general outlines of their figure, in their appetites, and their helpless formation.

They are both, therefore, described under the common appellation of the sloth, and their habitudes well deserve our wonder and curiosity. Nature seems cramped and constrained in their formation; other animals are often indolent from choice, these are slow from necessity; the *ai*, from which I shall take my description, and from which the other differs only in the slight particulars above-mentioned, and in being rather more active, is of about the size of a badger. Its fur is coarse and staring, somewhat resembling dried grass; the tail very short, and scarce appearing; the mouth extended from ear to ear; the eye dull and heavy; the feet armed with three claws each, and made so short, and set on so awkwardly, that a few paces is often the journey of a week; but though the feet are short, they are still longer

claws on the fore feet are extremely disproportionate; the outer one being very large, and the inner one much smaller. The whole animal is clothed in a beautiful, soft, curled, pale yellow fur. It is a native of Guiana. The prickly Ant-eater is a short, roundish animal, with a long tubular mouth, and entirely covered over on the upper parts with strong sharp spines, resembling those of the porcupine. Its tail is very short, and entirely concealed in the spines. The head, legs, and under-parts of the body, are thickly covered with a dark-brown harsh hair. On its fore feet are five strong claws, and four on the hinder. In its mode of life it resembles the rest of its tribe, being generally found in the midst of some large ant-hill. When disturbed, it burrows with great strength and despatch under ground, during which exertion its body is lengthened out in a surprising manner.

than its legs, and these proceed from the body in such an oblique direction, that the sole of the foot seldom touches the ground. When the animal, therefore, is compelled to make a step forward, it scrapes on the back of the nails along the surface, and wheeling the limbs circularly about, yet still touching the ground, it at length places its foot in a progressive position; the other three limbs are all brought about with the same difficulty; and thus it is seen to move, not above three feet in an hour. In fact, this poor creature seldom changes place but by constraint, and when impelled by the severest stings of hunger.

The sloth seems to be the meanest and most ill-formed of all those animals that chew the cud; it lives entirely upon vegetable food, on the leaves, the fruit, and the flowers of trees, and often even on the very bark, when nothing else is left on the tree for its subsistence. Like all other ruminant animals, it has four stomachs; and these requiring a large share of provision to supply them, it generally strips a tree of all its verdure in less than a fortnight. Still, however, it keeps aloft, unwilling to descend, while any thing remains that can serve it for food; it therefore falls to devouring the bark, and thus in a short time kills the tree upon which it found its support. Thus destitute of provisions above, and crawling slowly from branch to branch in hopes of finding something still left, it is at last obliged to encounter all the dangers that attend it below. Though it is formed by Nature for climbing a tree with great pain and difficulty, yet it is utterly unable to descend; it therefore is obliged to drop from the branches to the ground, and as it is incapable of exerting itself to break the violence of its descent, it drops like a shapeless heavy mass, and feels no small shock in the fall. There, after remaining some time torpid, it prepares for a journey to some neighbouring tree; but this of all migrations is the most tedious, dangerous, and painful; it often takes a week in crawling to a tree not fifty yards distant; it moves with imperceptible slowness, and often baits by the way. All motions seem to torture it, every step it takes it sets forth a most plaintive, melancholy cry, which, from some distant similitude to the human voice, excites a kind of disgust, mixed with pity. This plaintive sound seems its chief defence, few quadrupeds appear willing to interrupt its progress, either that the flesh is offensive, or that they are terrified at its cries. When at length they reach

their destined tree, they mount it with much greater ease than when they moved upon the plain. They fall to with famished appetite, and, as before, destroy the very source that supplies them.*

* Mr Waterton, in his "Wanderings in South America," has thrown a new and more agreeable light on the character of the Sloth. We extract in full his very interesting account of this animal.

"Let us now turn our attention," says he, "to the sloth, whose native haunts have hitherto been so little known, and probably little looked into. Those who have written on this singular animal have remarked that he is in a perpetual state of pain, that he is proverbially slow in his movements, that he is a prisoner in space, and that as soon as he has consumed all the leaves of the tree upon which he had mounted, he rolls himself up in the form of a ball, and then falls to the ground. This is not the case. If the naturalists who have written the history of the sloth had gone into the wilds, in order to examine his haunts and economy, they would not have drawn the foregoing conclusions; they would have learned, that though all other quadrupeds may be described while resting upon the ground, the sloth is an exception to this rule, and that his history must be written while he is in the tree.

"This singular animal is destined by nature to be produced, to live, and to die in the trees; and to do justice to him, naturalists must examine him in this his upper element. He is a scarce and solitary animal, and, being good food, he is never allowed to escape. He inhabits remote and gloomy forests where snakes take up their abode, and where cruelly stinging ants and scorpions, and swamps, and innumerable thorny shrubs and bushes, obstruct the steps of civilized man. Were you to draw your own conclusions from the descriptions which have been given of the sloth, you would probably suspect, that no naturalist has actually gone into the wilds with the fixed determination to find him out and examine his haunts, and see whether nature has committed any blunder in the formation of this extraordinary creature, which appears to us so forlorn and miserable, so ill put together, and so totally unfit to enjoy the blessings which have been so bountifully given to the rest of animated nature; for, as it has formerly been remarked, he has no soles to his feet, and he is evidently ill at ease when he tries to move on the ground, and it is then that he looks up in your face with a countenance that says, 'Have pity on me, for I am in pain and sorrow.'

"It mostly happens that Indians and Negroes are the people who catch the sloth, and bring it to the white man: hence it may be conjectured that the erroneous accounts we have hitherto had of the sloth, have not been penned down with the slightest intention to mislead the reader, or give him an exaggerated history, but that these errors have naturally arisen by examining the sloth in those places where nature never intended that he should be exhibited.

"However, we are now in his own domain. Man but little frequents these thick and noble forests, which extend far and wide on every side of us. This, then, is the proper place to go in quest of the sloth. We will first take a near view of him. By obtaining a knowledge of his anatomy, we shall be enabled to account for his movements hereafter, when we see

How far these may be considered as the unfinished productions of nature, I will not take upon me to determine; if we measure their happiness by our sensations, nothing, it is certain, can be more miserable; but it is probable, considered with re-

him in his proper haunts. His fore-legs, or, more correctly speaking, his arms, are apparently much too long, while his hind-legs are very short, and look as if they could be bent almost to the shape of a corkscrew. Both the fore and hind legs, by their form, and by the manner in which they are joined to the body, are quite incapacitated from acting in a perpendicular direction, or in supporting it on the earth, as the bodies of other quadrupeds are supported, by their legs. Hence, when you place him on the floor, his belly touches the ground. Now, granted that he supported himself on his legs like other animals, nevertheless he would be in pain, for he has no soles to his feet, and his claws are very sharp and long, and curved; so that, were his body supported by his feet, it would be by their extremities, just as your body would be were you to throw yourself on all fours, and try to support it on the ends of your toes and fingers—a trying position. Were the floor of glass, or of a polished surface, the sloth would actually be quite stationary; but as the ground is generally rough, with little protuberances upon it, such as stone, or roots of grass, &c., this just suits the sloth, and he moves his fore-legs in all directions, in order to find something to lay hold of; and when he has succeeded, he pulls himself forward, and is thus enabled to travel onwards, but at the same time in so tardy and awkward a manner, as to acquire him the name of sloth. Indeed his looks and his gestures evidently betray his uncomfortable situation; and as a sigh every now and then escapes him, we may be entitled to conclude that he is actually in pain.

“Some years ago I kept a sloth in my room for several months. I often took him out of the house, and placed him upon the ground, in order to have an opportunity of observing his motions. If the ground were rough, he would pull himself forwards, by means of his fore-legs, at a pretty good pace; and he invariably shaped his course towards the nearest tree. But if I put him upon a smooth and well-trodden part of the road, he appeared to be in trouble and distress: his favourite abode was the back of a chair; and after getting all his legs in a line upon the topmost part of it, he would hang there for hours together, and often, with a low and inward cry, would seem to invite me to take notice of him.

“The sloth, in its wild state, spends its whole life in the trees, and never leaves them but through force, or by accident. An all-ruling Providence has ordered man to tread on the surface of the earth, the eagle to soar in the expanse of the skies, and the monkey and squirrel to inhabit the trees: still these may change their relative situations without feeling much inconvenience; but the sloth is doomed to spend his whole life in the trees; and, what is more extraordinary, not *upon* the branches, like the squirrel and the monkey, but *under* them. He moves suspended from the branch, he rests suspended from it, and he sleeps suspended from it. To enable him to do this, he must have a very different formation from that of any other known quadruped. Hence, his seemingly bungled conformation is at once accounted for; and in lieu of the sloth leading a painful life, and entailing a melancholy and miserable existence on its progeny, it is but fair to sur-

gard to themselves, they may have some stores of comfort unknown to us, which may set them upon a level with some other inferior ranks of the creation ; if a part of their life be exposed to pain and labour, it is compensated by a larger portion of

ease that it just enjoys life as much as any other animal, and that its extraordinary formation and singular habits are but further proofs to engage us to admire the wonderful works of Omnipotence.

“ It must be observed, that the sloth does not hang head-downwards like the vampire. When asleep, he supports himself from a branch parallel to the earth. He first seizes the branch with one arm, and then with the other ; and after that, brings up both his legs, one by one, to the same branch ; so that all four are in a line : he seems perfectly at rest in this position. Now, had he a tail, he would be at a loss to know what to do with it in this position : were he to draw it up within his legs, it would interfere with them ; and were he to let it hang down, it would become the sport of the winds. Thus his deficiency of tail, is a benefit to him ; it is merely an apology for a tail, scarcely exceeding an inch and a half in length.

“ I observed, when he was climbing, he never used his arms both together, but first one and then the other, and so on alternately. There is a singularity in his hair, different from that of all other animals, and, I believe, hitherto unnoticed by naturalists ; his hair is thick and coarse at the extremity, and gradually tapers to the root, where it becomes fine as the finest spider's web. His fur has so much the hue of the moss which grows on the branches of the trees, that it is very difficult to make him out when he is at rest.

“ The male of the three-toed sloth has a longitudinal bar of very fine black hair on his back, rather lower than the shoulder-blades ; on each side of this black bar there is a space of yellow hair, equally fine ; it has the appearance of being pressed into the body, and looks exactly as if it had been signed. If we examine the anatomy of his fore legs, we shall immediately perceive by their firm and muscular texture, how very capable they are of supporting the pendent weight of his body, both in climbing and at rest ; and instead of pronouncing them a bungled composition, as a celebrated naturalist has done, we shall consider them as remarkably well calculated to perform their extraordinary functions.

“ As the sloth is an inhabitant of forests within the tropics, where the trees touch each other in the greatest profusion, there seems to be no reason why he should confine himself to one tree alone for food, and entirely strip it of its leaves. During the many years I have ranged the forests, I have never seen a tree in such a state of nudity ; indeed, I would hazard a conjecture, that, by the time the animal had finished the last of the old leaves, there would be a new crop on the part of the tree he had stripped first, ready for him to begin again, so quick is the process of vegetation in these countries.

“ There is a saying amongst the Indians, that when the wind blows, the sloth begins to travel. In calm weather he remains tranquil, probably not liking to cling to the brittle extremity of the branches, lest they should break with him in passing from one tree to another ; but as soon as the wind rises, the branches of the neighbouring trees become interwoven, and

plenty, indolence, and safety. In fact, they are formed very differently from all other quadrupeds, and, it is probable, they have different enjoyments. Like birds, they have but one common vent for the purposes of propagation, excrement, and urine.

then the sloth seizes hold of them, and pursues his journey in safety. There is seldom an entire day of calm in these forests. The trade-wind generally sets in about ten o'clock in the morning, and thus the sloth may set off after breakfast, and get a considerable way before dinner. He travels at a good round pace; and were you to see him pass from tree to tree, as I have done, you would never think of calling him a sloth.

"Thus, it would appear that the different histories we have of this quadruped are erroneous on two accounts: first, that the writers of them, deterred by difficulties and local annoyances, have not paid sufficient attention to him in his native haunts; and secondly, they have described him in a situation in which he was never intended by nature to cut a figure; I mean on the ground. The sloth is as much at a loss to proceed on his journey upon a smooth and level floor, as a man would be who had to walk a mile on stilts upon a line of feather beds.

"One day, as we were crossing the Essequibo, I saw a large two-toed sloth on the ground upon the bank; how he had got there nobody could tell: the Indian said he had never surprised a sloth in such a situation before: he would hardly have come there to drink, for both above and below the place, the branches of the trees touched the water, and afforded him an easy and safe access to it. Be this as it may, though the trees were not above twenty yards from him, he could not make his way through the sand time enough to escape before we landed. As soon as we got up to him he threw himself upon his back, and defended himself in gallant style with his fore-legs. "Come, poor fellow," said I to him, "if thou hast got into a hobble to-day, thou shalt not suffer for it: I'll take no advantage of thee in misfortune; the forest is large enough both for thee and me to rove in: go thy ways up above, and enjoy thyself in these endless wilds; it is more than probable thou wilt never have another interview with man. So fare thee well." On saying this, I took up a long stick which was lying there, held it for him to hook on, and then conveyed him to a high and stately Mora. He ascended with wonderful rapidity, and in about a minute he was almost at the top of the tree. He now went off in a side direction, and caught hold of the branch of a neighbouring tree; he then proceeded towards the heart of the forest. I stood looking on, lost in amazement at his singular mode of progress. I followed him with my eye till the intervening branches closed in betwixt us; and then I lost sight for ever of the two-toed sloth. I was going to add that I never saw a sloth take to his heels in such earnest; but the expression will not do, for the sloth has no heels.

"That which naturalists have advanced of his being so tenacious of life, is perfectly true. I saw the heart of one beat for half an hour after it was taken out of the body. The wourali poison seems to be the only thing that will kill it quickly. A poisoned arrow killed the sloth in about ten minutes.

"So much for this harmless, unoffending animal. He holds a conspicuous place in the catalogue of the animals of the new world. Though naturalists have made no mention of what follows, still it is not less true on that ac-

Like the tortoise, which they resemble in the slowness of their motion, they continue to live some time after their nobler parts are wounded, or even taken away. They bear the marks of all those homely-formed animals, that, like rude machines, are not easily discomposed.

Its note,¹ according to Kircher, is an ascending and descending hexachord, which it utters only by night; its look is so piteous, as to move compassion; it is also accompanied with tears, that dissuade everybody from injuring so wretched a being. Its abstinence from food is remarkably powerful; one that had fastened itself by its feet to a pole, and was so suspended across two beams, remained forty days, without meat, drink, or sleep; the strength of its feet is so great, that whatsoever it seizes on cannot possibly be freed from its claws. A dog was let loose at the above-mentioned animal, taken from the pole; after some time the sloth laid hold of the dog with its feet, and held him four days, till he perished with hunger.²

count. The sloth is the only quadruped known, which spends its whole life from the branch of a tree, suspended by his feet. I have paid uncommon attention to him in his native haunts. The monkey and squirrel will seize a branch with their fore feet, and pull themselves up, and rest or run upon it; but the sloth, after seizing it, still remains suspended, and suspended moves along under the branch till he can lay hold of another. Whenever I have seen him in his native woods, whether at rest, or asleep, or on his travels, I have always observed that he was suspended from the branch of a tree. When his form and anatomy are attentively considered, it will appear evident that the sloth cannot be at ease in any situation, where his body is higher, or above his feet. We will now take our leave of him."

1 Pennant's Synopsis.

2 In addition to the two here mentioned, another, and by far the largest of its kind, has lately been introduced to the notice of naturalists from India. This animal approaches in size and shape to that of the common bear, being clothed with a very long black shaggy hair. Its snout is a little elongated, and appears as if cut off at the end. The feet are all armed with five crooked pointed claws; and the tail is short, and hardly visible. In its motions, it was not, as in the others, slow and languid; but it appeared moderately lively, and gave a kind of short abrupt roar when disturbed or irritated. It fed principally upon vegetables and milk, and was much delighted with honey and sweet things. It was said to burrow, and to have been dug out of its subterraneous retreat when first discovered.

CHAP. XVI.

THE JERBOA.*

THIS animal as little resembles a quadruped, as that which has been described in a former chapter. If we should suppose

* See the Note to page 339 of this volume for a further account of the Jerboa.—An animal somewhat resembling the Jerboa, but which has not yet been classified by naturalists, is the *Chinchilla*. Notwithstanding the extensive traffic carried on in the skins of this animal, little was correctly known regarding it until the publication, in 1830, of “The Gardens and Menageries of the Zoological Society delineated,” from which volume we shall take the liberty of extracting the following interesting account of this useful creature, being the first which has appeared in the English language.—“The earliest account, of the chinchilla with which we have met is contained in Father Joseph Acosta’s Natural and Moral History of the East and West Indies, published at Barcelona, in Spanish, in the year 1591. From an English translation of this work, printed at London in 1604, we extract the following sentence, which is all that relates to the animal in question. “The chinchilles is another kind of small beasts, like squirrels, they have a wonderful smoothe and soft skinne, which they weare as a healthfull thing to comfort the stomacke, and those parts that have neede of a moderate heate;” [as most “beasts” do; but the concluding part of the extract shows that this is spoken of the human natives, not of the poor chinchillas themselves;] “they make coverings and rugges of the haire of these chinchilles, which are found on the Sierre of Peru.”

“We find these animals again mentioned, and nearly to the same purpose, in “The Observations of Sir Richard Hawkins, Knight, in his Voyage into the South Sea, An. Dom. 1593,” published at London in a small folio, in the year 1622, and reprinted, three years afterwards, in the fourth part of “Purchas his Pilgrims.” This hardy and adventurous seaman appears, notwithstanding the somewhat contemptuous manner in which he speaks of the “princes and nobles” that “laie waite” for these skins, to have been much of the same opinion with regard to their superior quality and comfort. It is worthy of remark that he treats them not as wool, in which light Acosta seems to have regarded them, but as fur. “Amongst others,” he says, (showing, by the by, as little respect for the niceties of grammar as the translator above quoted), “they have little beastes, like unto a squirrell, but that hee is grey, his skinne is the most delicate soft and curious furre that I have seene, and of much estimation, (as is reason,) in the Peru; few of them come into Spaine, because difficult to be come by, for that the princes and nobles laie waite for them, they call this beast Chinchilla, and of them they have great abundance.”

“In the foregoing quotations the chinchilla is only said to be like a squirrel: later writers appear to have confounded them. Thus when Alonso de Ovalle, another Spaniard, whose “Historical Relation of the Kingdom of Chili” was published at Rome in 1646, says that “the squirrels [Ardas] which are found only in the Valley of Guasco, are ash-coloured, and their

a bird, divested of its feathers, and walking upon its legs, it might give us some idea of its figure. It has fore feet indced, but in running, or resting, it never makes use of any but the hinder. The number of legs, however, do not much contribute to any

skins are in great esteem for the fineness and softness of the fur," he evidently means the chinchilla; for no species of squirrel, whose fur is of any value, is found in that country. The same may also be said of an anonymous Italian author, (considered by some bibliographers, but we believe erroneously, to have been the Abbe Vidaure,) who published at Bologna in 1776 a Compendium of the Geographical, Natural, and Civil History of the Kingdom of Chili. This writer speaks of the Arda, which is the Spanish word for a squirrel, as a species of rat or campagnol, of the size of a cat, found only in the province of Copiapo, moderately docile, and covered with ash-coloured wool, as close and delicate as the finest cotton.

"But this confusion of species becomes tolerable if compared with another into which the same author has fallen when he speaks of the chinche, the most insupportably offensive of all stinking animals, as having a remarkably soft fur, which is made into coverlets for beds. The responsibility, however, for the latter error must rest with Buffon; who, after quoting Feuillee's excellent description of that abominable beast, adds: "it appears to me that the same animal is indicated by Acosta under the name of chinchilla, which is not very different from that of chinche." How this great naturalist could have been led to confound two animals so essentially distinct in every particular, of one of which he had a specimen in good preservation, while the skins of the other, mutilated it is true, but still distinctly recognisable, might probably have been seen in the warehouse of every furrier, we are at a loss to conjecture. The circumstance itself affords a striking proof of the obscurity in which the history of the chinchilla was then involved, when the mere similarity of sound in the names was the solitary argument advanced in favour of so unfortunate a conjecture. The error was corrected by D'Azara, who is, however, himself mistaken in regarding the chinche of Feuillee and Buffon as his Yagauare, and who adds nothing to what was already known with respect to the true chinchilla.

"Molina's Essay on the Natural History of Chili was originally published in Italian at Bologna in 1782. In the preface the author candidly confesses that his materials are not sufficiently complete for a general Natural History of the country. They appear indeed to have consisted partly of the recollection of a vigorous mind, and partly of such imperfect notes as could only be made use of in the way of hints to recall to the memory some of those minor points which might otherwise have escaped it. It is obvious that under such circumstances, however careful the writer may have been to avoid mistakes, it is impossible to place in his descriptions that implicit confidence to which his acknowledged good faith would otherwise entitle him. In this work he describes the chinchilla as a species of the Linnæan genus *Mus*, under the name of *Mus laniger*, by which appellation it was received into Gmelin's Edition of the *Systema Nature*, and continued to be known among naturalists, until M. Geoffroy Saint-Hilaire suggested that it ought rather to be regarded as a species of the genus separated by him from the rats under the name of *Hamster*. This opinion was immediately adopted by zoologists, and seems to have been

animal's speed; and the jerboa, though, properly speaking, furnished but with two, is one of the swiftest creatures in the world.

The jerboa is not above the size of a large rat, and its head is

taken up by Molina himself, in a second edition of his *Essay*, published in 1810, which contains some trifling additions to his former article on the chinchilla. We proceed to translate from the latter those passages which relate to the subject. 'The chinchilla,' he says, 'is another species of field-rat, in great estimation for the extreme fineness of its wool, if a rich fur as delicate as the silken webs of the garden spiders may be so termed. It is of an ash-grey, and sufficiently long for spinning. The little animal which produces it is six inches long from the nose to the root of the tail, with small pointed ears, a short muzzle, teeth like the house-rat, and a tail of moderate length, clothed with a delicate fur. It lives in burrows underground in the open country of the northern provinces of Chili, and is very fond of being in company with others of its species. It feeds upon the roots of various bulbous plants which grow abundantly in those parts; and produces twice a year five or six young ones. It is so docile and mild in temper that if taken into the hands it neither bites nor tries to escape; but seems to take a pleasure in being caressed. If placed in the bosom it remains there as still and quiet as if it were in its own nest. This extraordinary placidity may possibly be rather due to its pusillanimity, which renders it extremely timid. As it is in itself peculiarly cleanly, there can be no fear of its soiling the clothes of those who handle it, or of its communicating any bad smell to them, for it is entirely free from that ill odour which characterizes the other species of rats. For this reason it might well be kept in the houses with no annoyance and at a trifling expense, which would be abundantly repaid by the profits on its wool. The ancient Peruvians, who were far more industrious than the modern, made of this wool coverlets for beds and valuable stuffs.—There is found,' he adds, 'in the same northern provinces another little animal with fine wool called the Hardilla, which is variously described by those who have seen it; but as I have never observed it myself, I cannot determine to what genus it belongs.' There can be little doubt, we should imagine, that this animal is identical with the chinchilla, the latter, as we have already seen, being frequently spoken of by the name of arda, the same with harda, of which hardilla is only the diminutive.

"We shall conclude our quotations of former notices with the following extract from Schmidtmeier's "*Travels into Chile over the Andes*," London, 4to., 1824; which furnishes some particulars, apparently derived from the traveller's own observation, that had not been touched upon by previous writers. "The chinchilla," he says, "is a woolly field-mouse, which lives underground, and chiefly feeds on wild onions. Its fine fur is well known in Europe; that which comes from Upper Peru is rougher and larger than the chinchilla of Chile, but not always so beautiful in its colour. Great numbers of these animals are caught in the neighbourhood of Coquimbo and Copiapo, generally by boys with dogs, and sold to traders who bring them to Santiago and Valparayso, from whence they are exported. The Peruvian skins are either brought to Buenos-Ayres from the eastern parts of the Andes, or sent to Lima. The extensive use of this fur has lately occasioned a very considerable destruction of the animals."

sloped somewhat in the manner of a rabbit; the teeth also are formed like those of the rat kind, there being two cutting teeth in each jaw; it has a very long tail, tufted at the end; the head, the back, and sides, are covered with long ash-coloured soft

“Such is the history of our knowledge of this interesting animal until the arrival of a living specimen which was brought to England by the late expedition to the north-west coast of America, under the command of Captain Beechey, and by him presented to the Zoological Society. An entire skin, rendered particularly valuable in consequence of its having the skull preserved in it, was at the same time brought home by Mr Collie, the surgeon of Captain Beechey's vessel, and deposited in the collection of the British Museum. We have thus fortunately placed within our reach the means of correcting many of the errors into which former writers have fallen with regard to it, and of giving a more complete description of it than has yet been laid before the world.

“To begin with its generic characters. The slightest inspection of its teeth was sufficient to prove that it could no longer be associated with the groups in which it had been previously placed; and a closer examination served only to confirm the idea that it was equally distinct in character from every other known genus of Rodentia. In proof of the former part of this assertion we borrow from the Zoological Journal Mr Yarrell's description of these organs, taken from the specimen before-mentioned, with one indispensable alteration, of which that gentleman has himself since seen the necessity. He there describes the teeth as consisting of two incisors in each jaw, and of four molars on either side; the three anterior of the upper jaw formed of two parallel bony portions with three alternating lines of enamel, and the fourth having an additional portion of bone and enamel, but smaller than the two principal ones. The direction of the parallel laminae of these teeth is not at right angles with the line of the maxillary bone, but inclining obliquely from without backwards; and the molars of the lower jaw are placed still more obliquely than those of the upper.

“But the examination on which this statement was founded was made under circumstances of great disadvantage, inasmuch as it is almost impossible to obtain a distinct view of the teeth of any animal while the skull remains within the skin, from which it was of course not allowable in the present instance to remove it. The necessity for the alteration to which we have before alluded has been rendered obvious only since the skin was transferred to the British Museum, by the extraction from the lower jaw of the two anterior molars of the right side, which are now shown each to possess a smaller third lamina of bone, with its corresponding enamel, placed in front of, and not projecting so far externally as, the two remaining portions of the tooth. This third lamina is separated from that next to it by a deep groove on the inner side, but on the outer there is no indication of such a division; the inner surface of each of these teeth consequently offers two such grooves, while the outer presents no more than one.

“In the observations appended to his account of the teeth Mr Yarrell appears to consider the chinchilla as nearly allied to Mr Brookes's new genus *Lagostomus*, of which a figure and description are contained in the last published part (the first of the sixteenth volume) of the *Linnean Transactions*;

hair; the breast and belly is whitish; but what most deserves our attention in the formation of this little animal, is the legs; the fore-legs are not an inch long, with four claws and a thumb upon each, while the hinder legs are two inches and a quarter,

and the general resemblance of form, together with the characters of the teeth as given in that notice, unquestionably warrant at least a close approximation. But we apprehend that the alteration above made in the description of the teeth of the chinchilla, together with the discrepancy in the number of the toes, which in our animal are four on the hind feet, while in *lagostomus* they are but three, will be considered fully sufficient to establish a generic difference between them. The close affinity subsisting between these animals has been subsequently recognised by M. Cuvier from the very imperfect materials in his possession, consisting only of mutilated skins of the one and drawings and descriptions of the other. In the new edition, just published, of his *Regne Animal* he regards them both as decidedly forming part of the same genus; but does not venture, until he shall have seen their teeth, to determine their position in the series, which he considers so uncertain as to render it doubtful whether they approach most nearly to the guinea-pigs, the lagomies, or the rats. In the removal of these doubts we are happy to assist by furnishing the proof that, although generically distinct, they both evidently belong to the same natural tribe, and contribute, along with lagomies and pedetes, to establish a connexion between the otherwise widely separated families of the hares and the jerboas.

"The length of the body in our specimen is about nine inches, and that of the tail nearly five. Its proportions are close-set, and its limbs comparatively short, the posterior being considerably longer than the anterior. The fur is long, thick, close, woolly, somewhat crisped and entangled together, grayish or ash-coloured above, and paler beneath. The form of the head resembles that of the rabbit; the eyes are full, large and black; and the ears broad, naked, rounded at the tips, and nearly as long as the head. The moustaches are plentiful and very long, the longest being twice the length of the head, some of them black, and others white. Four short toes, with a distinct rudiment of a thumb, terminate the anterior feet; and the posterior are furnished with the same number, three of them long, the middle more produced than the two lateral ones, and the fourth, external to the others, very short and placed far behind. On all these toes the claws are short, and nearly hidden by tufts of bristly hairs. The tail is about half the length of the body, of equal thickness throughout, and covered with long bushy hairs; it is usually kept turned up towards the back, but not reverted as in the squirrels.

"To the account of its habits given by Molina we can only add that it usually sits upon its haunches, and is even able to raise itself up and stand upon its hinder feet. It feeds in a sitting posture, grasping its food and conveying it to its mouth by means of its fore paws. In its temper it is generally mild and tractable, but it will not always suffer itself to be handled without resistance, and sometimes bites the hand which attempts to fondle it when not in a humour to be played with.

"Although a native of the alpine valleys of Chili, and consequently subjected in its own country to the effects of a low temperature of the atmo-

and exactly resemble those of a bird, there being but three toes, the middlemost of which is longest.

The jerboa is found in Egypt, Barbary, Palestine, and the deserts between Bassorah and Aleppo; its hind-legs, as was said before, are only used in running, while the fore-paws, like those of a squirrel, grasp its food, and in some measure perform the

sphere, against which its thick coat affords an admirable protection, it was thought necessary to keep it during the winter in a moderately warm room, and a piece of flannel was even introduced into its sleeping apartment for its greater comfort. But this indulgence was most pertinaciously rejected, and as often as the flannel was replaced, so often was it dragged by the little animal into the outer compartment of its cage, where it amused itself with pulling it about, rolling it up and shaking it with its feet and teeth. In other respects it exhibits but little playfulness, and gives few signs of activity; seldom disturbing its usual quietude by any sudden or extraordinary gambols, but occasionally displaying strong symptoms of alarm when startled by any unusual occurrence. It is, in fact, a remarkably tranquil and peaceable animal unless when its timidity gets the better of its gentleness.

"A second individual of this interesting species has lately been added to the collection by the kindness of Lady Knighton, in whose possession it had remained for twelve months previously to her presenting it to the Society. This specimen is larger in size and rougher in its fur than the one above described; its colour is also less uniformly gray, deriving a somewhat mottled appearance from the numerous small blackish spots which are scattered over the back and sides. It is possible that this may be the Peruvian variety, mentioned in the extract from Schmidtmeier's Travels as furnishing a less delicate and valuable fur than the Chilian animal. It is equally good tempered and mild in its disposition; and, probably in consequence of having been domiciliated in a private house instead of having been exhibited in a public collection, is much more tame and playful. In its late abode it was frequently suffered to run about the room, when it would show off its agility by leaping to the height of the table. Its food consisted principally of dry herbage, such as hay and clover, on which it appears to have thriven greatly. That of the Society's original specimen has hitherto been chiefly grain of various kinds, and succulent roots.

"When the new comer was first introduced into Bruton Street, it was placed in the same cage with the other specimen; but the latter appeared by no means disposed to submit to the presence of the intruder. A ferocious kind of scuffling fight immediately ensued between them, and the latter would unquestionably have fallen a victim, had it not been rescued from its impending fate. Since that time they have inhabited separate cages, placed side by side; and although the open wires would admit of some little familiarity taking place between them, no advances have as yet been made on either side. Such an isolated fact can, of course, have little weight in opposition to the testimony of Molina that the chinchilla is fond of company. It is nevertheless a remarkable circumstance, and deserves to be mentioned in illustration of the habits of these animals."

office of hands. It is often seen by travellers as they pass along the deserts, crossing their way, and jumping six or eight feet at every bound and going so swiftly, that scarce any other quadruped is able to overtake them. They are a lively, harmless race of animals, living entirely upon vegetables, and burrowing like rabbits in the ground. Mr Pennant tells us of two that were lately brought to London, that burrowed almost through the brick wall of the room where they were kept; they came out of their hole at night for food, and, when caught were much fatter and sleeker than when confined to their burrows. A variety of this animal is found also in Siberia and Circassia, and is, most probably, common enough over all Asia. They are more expert diggers than even the rabbit itself; and when pursued for a long time, if they cannot escape by their swiftness, they try to make a hole instantly in the ground, in which they often bury themselves deep enough to find security before their pursuers come up. Their burrows, in some places, are so thick, as to be dangerous to travellers, the horses perpetually falling in them. It is a provident little animal, and lays up for the winter. It cuts grass in heaps of a foot square, which, when dried, it carries into its burrow, therewith to serve it for food, or to keep its young warm during the rigours of the winter.

But of all animals of this kind, that which was first discovered and described by Mr Banks, is the most extraordinary. He calls it the *kangaroo*; and though from its general outline, and the most striking peculiarities of its figure, it greatly resembles the jerboa, yet it entirely differs, if we consider its size, or those minute distinctions which direct the makers of systems in assorting the general ranks of nature.*

* *The Gigantic Kangaroo (of Cook).*—Buffon, whose only errors were those of genius, clearly perceived that every continent, in its animal productions, presented the appearance of an especial creation; but he gave a universality to this proposition, of which it is not altogether susceptible. It is nevertheless true, even at the present day, within certain limits. A great number of the Asiatic animals are not found in Africa, and *vice versa*. The Lemurs seem to exist only in Madagascar. America is peopled with a host of Mammalia, exclusively peculiar to itself, and there are many more in Europe not to be found in the other quarters of the globe. The discovery of Australasia has given an additional support to this opinion of Buffon. The species of animals there discovered, have not only no affinity with those of the other continents, but in fact, belong for the most part to genera altogether different. Such are those Mammalia which the natives of New

The largest of the jerboa kind which are to be found in the ancient continent, do not exceed the size of a rabbit. The kangaroo of New Holland, where it is only to be found, is often known to weigh above sixty pounds, and must consequently be as large as a sheep. Although the skin of that which was stuffed and brought home by Mr Banks, was not much above the size of a hare, yet it was greatly superior to any of the jerboa kind that have been hitherto known, and very different in many particulars. The snout of the jerboa, as has been said, is short and round, that of the discovered animal long and slender; the

Holland call Kangaroo, and which offer to the observation of the naturalist, organic peculiarities perceivable in no other animal, with the exception of one single species. It is in this tribe that for the first time we view the singular phenomenon of an animal using its tail as a third hind leg in standing upright and in walking. The species we are now upon has received the name of Gigantic, because when named, it was supposed to be the largest of all that are known.

These singular animals were among the first fruits which accrued to natural history from the discovery of New South Wales, a country which has since proved so fertile in new and remarkable forms both of the animal and vegetable creations. Their natural habits in a wild state are still, however, very imperfectly known. They appear to live in small herds, perhaps single families, which are said to submit to the guidance of the older males, and to inhabit in preference the neighbourhood of woods and thickets. They are, as might be inferred from the small size of their mouths and the peculiar character of their teeth, purely herbivorous, feeding chiefly upon grass and roots. Their flesh is eaten by the colonists, by whom it is said to be nutritious and savoury, an assertion which is confirmed by those who have partaken of it in England. In order to procure this they are frequently hunted in their native country; but the dogs who are employed in this service sometimes meet with dangerous wounds, not only from the blows of their powerful tail, which is their usual weapon of defence, but also from the claws of their hind feet, with which they have been known to lacerate the bodies of their assailants in a shocking manner. But, unless when thus driven to make use of such powers of self-defence as they possess, they are perfectly harmless and even timid; and, when domesticated, are not in the least mischievous. In several collections in this country, they have become almost naturalized, and appear to be but little affected by the change of climate. When confined in a small inclosure, they uniformly make their path round its circuit, seldom crossing it or passing in any other direction except for the purpose of procuring their food. Their whole appearance, and especially their mode of progression, is singularly curious, and even to a certain extent ludicrous.

Modern naturalists have attempted to distinguish several species among the Kangaroos; but as the characters on which these are founded consist merely in difference of size and slight modifications of colour, a much more complete acquaintance with them than we yet possess is requisite before they can safely be adopted.

teeth also entirely differ; for as the jerboa has but two cutting teeth in each jaw, making four in all, this animal, besides its cutting teeth, has four canine teeth also; but what makes a more striking peculiarity, is the formation of its lower jaw, which, as the ingenious discoverer supposes, is divided into two parts, which open and shut like a pair of scissars, and cut grass, probably this animal's principal food. The head, neck, and shoulders are very small in proportion to the other parts of the body; the tail is nearly as long as the body, thick near the rump, and tapering towards the head and ears, which bear a slight resemblance to those of the hare. We are not told, however, from the formation of its stomach, to what class of quadrupeds it belongs; from its eating grass, which it has been seen to do, one would be apt to rank it among the ruminating animals; but, from the canine teeth which it is found to have, we may on the other hand suppose it to bear some relation to the carnivorous. Upon the whole, however, it can be classed with none more properly, than with animals of the jerboa kind, as its hind legs are so much longer than the fore; it moves also precisely in the same manner, taking great bounds of ten or twelve feet at a time, and thus sometimes escaping even the fleetest greyhound with which Mr Banks pursued it. One of them that was killed proved to be good food; but a second, which weighed eighty-four pounds, and was not yet come to its full growth, was found to be much inferior.

With this last described and last discovered animal, I shall conclude the history of quadrupeds, which of all parts of natural knowledge seems to have been described the most accurately. As these, from their figure, as well as their sagacity, bear the nearest resemblance to man, and from their uses or enmities are the most respectable parts of the inferior creation; so it was his interest, and his pleasure, to make himself acquainted with their history. It is probable therefore that time, which enlarges the sphere of our knowledge in other parts of learning, can add but very little to this. The addition of a new quadruped to the catalogue already known, is of no small consequence, and happens but seldom; for the number of all is so few, that wherever a new one is found, it becomes an object worthy our best attention. It may take refuge in its native deserts from our pursuits, but not from our curiosity.

But it is very different with the inferior ranks of the creation ; the classes of birds, of fishes, and of insects, are all much more numerous, and more incompletely known. The quadruped is possessed of no arts of escaping, which we are not able to overcome ; but the bird removes itself by its swiftness, the fishes find protection in their native element, and insects are secured in their minuteness, numbers, and variety. Of all these, therefore, we have but a very inadequate catalogue ; and though the list be already very large, yet every hour is adding to its extent.

In fact, all knowledge is pleasant only as the object of it contributes to render man happy ; and the services of quadrupeds being so very necessary to him in every situation, he is particularly interested in their history : without their aid, what a wretched and forlorn creature would he have been ! the principal part of his food, his clothing, and his amusements, are derived wholly from them ; and he may be considered as a great lord, sometimes cherishing his humble dependents, and sometimes terrifying the refractory, to contribute to his delight and conveniences.

The horse and the ass, the elephant, the camel, the lama, and rein-deer, contribute to ease his fatigues, and to give him that swiftness which he wants from nature. By their assistance, he changes place without labour ; he attains health without weariness ; his pride is enlarged by the elegance of equipage, and other animals are pursued with a certainty of success. It were happy indeed for man, if, while converting these quadrupeds to his own benefit, he had not turned them to the destruction of his fellow-creatures ; he has employed some of them for the purposes of war, and they have conformed to his noxious ambition with but too fatal an obedience.

The cow, the sheep, the deer, and all their varieties, are necessary to him, though in a different manner. Their flesh makes the principal luxuries of his table, and their wool or skins the chief ornament of his person. Even those nations that are forbid to touch any thing that has life, cannot wholly dispense with their assistance. The milk of these animals makes a principal part of the food of every country, and often repairs those constitutions that have been broken by disease or intemperance.

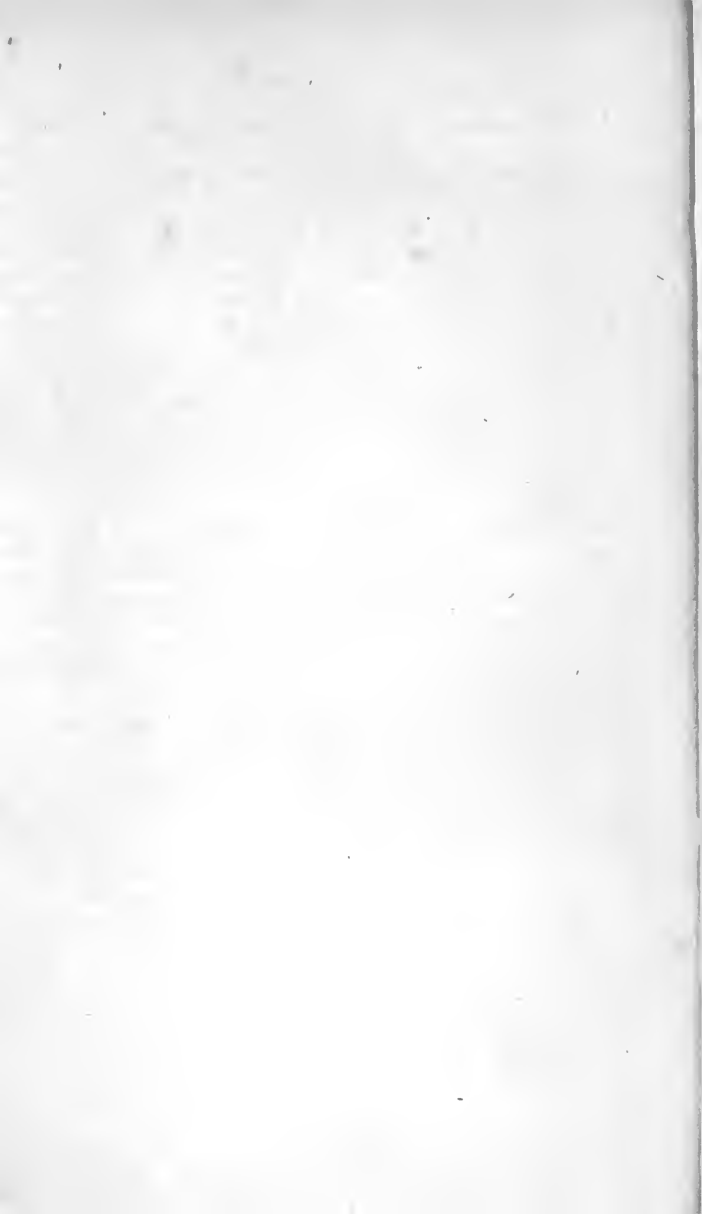
The dog, the cat, and the ferret, may be considered as having deserted from their fellow-quadrupeds, to list themselves under

the conduct and protection of man. At his command they exert all their services against such animals as they are capable of destroying, and follow them into places where he himself wants abilities to pursue.

As there is thus a numerous tribe, that he has taken into protection, and that supplies his necessities and amusements, so there is also a still more numerous one, that wages an equal combat against him, and thus calls forth his courage and his industry. Were it not for the lion, the tiger, the panther, the rhinoceros, and the bear, he would scarcely know his own powers, and the superiority of human art over brutal fierceness. These serve to excite, and put his nobler passions into motion. He attacks them in their retreat, faces them with resolution, and seldom fails of coming off with a victory. He thus becomes hardier and better in the struggle, and learns to know and to value his own superiority.

As the last mentioned animals are called forth by his boldest efforts, so the numerous tribe of the smaller vermin kind excite his continual vigilance and caution ; his various arts and powers have been nowhere more manifest, than in the extirpation of those that multiply with such prodigious fecundity. Neither their agility nor their minuteness can secure them from his pursuits ; and though they may infest, they are seldom found materially to injure him.

In this manner we see, that not only human want is supplied, but that human wit is sharpened, by the humbler partners of man in the creation. By this we see, that not only their benefits but their depredations are useful, and that it has wisely pleased Providence to place us like victors in a subdued country, where we have all the benefit of conquest, without being so secure as to run into the sloth and excesses of a certain and undisturbed possession. It appears, therefore, that those writers who are continually finding immediate benefit in every production, see but half way into the general system of nature. Experience must every hour inform us, that all animals are not formed for our use ; but we may be equally well assured, that those conveniences which we want from their friendship, are well repaid by that vigilance which we procure from their enmity.





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